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PATHOLOGICAL SPECIMENS

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**THE ROYAL COLLEGE OF SURGEONS
OF ENGLAND.**

L. Charles Barker

SUPPLEMENT II.

ADDITIONAL SPECIMENS OF INJURIES AND DISEASES OF THE EYE.



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P R E F A C E.

THIS Volume contains the description of a series of preparations illustrating the results of Injuries and Diseases of the Eye, made during the years 1860-62, by Mr. CHARLES BADER, then one of the Assistants in the Museum ; by whom also the Catalogue has been drawn up.

The specimens consist almost wholly of eyes which have been excised during the lifetime of the patient, in consequence of destructive morbid changes in the tissues of the globe, resulting in loss of vision. Except where otherwise stated in the description, they are all preserved in pure glycerine. The sections for microscopic examination were prepared according to the following method :—

The portion of the eye reserved for sections is placed, as fresh as possible, in a solution of chromic acid, in which it is allowed to remain from three to six days, when the transparent parts will have become opaque and of a yellowish-white colour. Before making the sections, the retina is placed on a thin piece of black, the choroid on a similar piece of white cardboard, which is then fixed on a flat piece of cork with insect-pins. After the retina or choroid is properly fixed on the cork plate, those portions of tissue which might interfere while making the sections are cut off with a sharp scalpel. To make transverse sections of the optic nerve where it passes through the retinal aperture, the nerve, with a small portion of the adjoining tunics of the eye, is removed from the remainder of the eyeball with sharp scissors, placed for six days in the solution of chromic acid, and then

fixed with its nerve-fibres parallel to the surface of a piece of cardboard which is previously placed upon the cork. Care must be taken, in doing this, not to stretch the fibres of the nerve. In order to steady the movements of the razor, it is made to glide along a straight, strong darning-needle, which is held perpendicularly in the left hand, close to the part from which the sections are made. The mere weight of the razor completes the retina sections; a very slight drawing movement is required when making sections of the optic nerve where it passes through the choroid and sclerotic. From three to five sections are made successively without altering the plane of the razor, by commencing with the part nearest the handle; the section thus obtained is allowed to adhere to the razor-plate, another section is then made with the nearest free portion of the blade, and so on: thus equal sections are obtained, and the structure of the part is better understood, by being able to compare adjoining portions. All sections obtained with one cut are generally placed upon one slide. The sections are then mounted in pure glycerine.

SUPPLEMENT II.

ADDITIONAL SPECIMENS OF INJURIES AND DISEASES OF THE EYE.

A.—*Morbid changes of the Eyeball, resulting from injury.*

1. The inferior half of a right eye, the section being carried through the middle of the optic nerve, and parallel with the nerve-fibres. The eye is much enlarged; the sclerotic is extremely thin; a black line which runs parallel with the sclerotic indicates the position of the choroid; the vitreous space is occupied by pus and lymph, the central portions of which have a more flocculent appearance. The cornea, iris, and lens are in apposition with each other; the lens is flattened, yellow, and opaque.

2. The other half of the same eye.

W. C., aged 17 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy, fair boy, ran a clean awl into the right eye, eighteen days ago. He could see to tell the time on a small watch for twenty-four hours after the injury, but after another day had lost all perception of light. Pain commenced immediately after the injury, increasing up to the time of excision, and extending over all the branches of the fifth nerve. The left eye suffered from photophobia and lachrymation.

The right eye was excised, 23rd of November, 1861, and, upon examination, there was found as follows:—Pus in the anterior chamber and in the sclerotic wound; the iris (the pupil being closed by an opaque membrane) pressed upon the cornea; the retina infiltrated with pus, yellow and opaque, and, near the ora serrata, detached from the choroid, its layers appearing separated by pus in several places. The space between the choroid and the detached retina was occupied by pus.

3. The lateral half of an enlarged right eye. The section is carried through the optic nerve, parallel with its nerve-fibres. The sclerotic and the brown choroid are in apposition, and thickened by deposits of fibrin and pus. The

retina is yellow, opaque, thickened, and slightly detached from the choroid. The vitreous space is occupied by a yellow, flocculent substance composed of pus, lymph, and vitreous substance. The lens has been removed. The lens-capsule, iris, and cornea are thickened and agglutinated together by pus and lymph.

4. The other half of the same eye, preserved in glycerine. The retina and the contents of the vitreous space have been removed. The black pigment at the ora serrata, and its insular arrangement in the choroid, may be observed.

J. S., aged 42, a smith (under the care of Mr. Poland, Royal London Ophthalmic Hospital), of fair complexion and general good health, suffered severely from small-pox in infancy; on recovery, a white speck remained on the right eye; vision was so much impaired that, with this eye, he could only recognize persons when close to him. Ten years ago it was struck by a piece of steel, which led to an increase of the speck and to a further slight impairment of vision. Five months ago, some dirt flew into the left eye; inflammation continued for two months, attended with hypopion, reducing vision to perception of light, and leaving anterior synechiæ and small opacities of the cornea. On the 9th of October, 1861, iridectomy was performed on both eyes. Left eye reads No. 6 of Jäger's test-type slowly, and tells the time on a distant clock. In the right eye, eighteen hours after the iridectomy, there was sensation of heat; eighteen hours later, pain in the right temple and orbital region, with chemosis; twenty hours later, severe chemosis, infiltration of the entire cornea with pus; and flashes of light, when turning quickly, were experienced. There was lachrymation and photophobia of the left eye.

The right eye was excised on the 12th of October. The recti muscles and the surrounding orbital tissue adhered to the sclerotic by a fibrinous effusion. The eye was much enlarged, and slightly staphylomatous in the region of the yellow spot. The remaining morbid appearances are seen in the preparation.

5. A lateral portion of a left eye, showing the effects of acute suppuration of the eyeball. The sclerotic and choroid are in apposition. Portions of the recti muscles and of the orbital tissue are abnormally thickened and adherent to the outer surface of the sclerotic; the latter is swollen. The inner surface of the infiltrated choroid is sprinkled with brown and yellow patches: the latter are portions of choroid infiltrated with pus, exposed after removal of the choroidal epithelium; the former are portions of the epithelium. The yellow, opaque, and partly flocculent substance within the choroid is the retina and the contents of the vitreous space greatly changed by the acute suppuration. No lens was found. The swollen infiltrated iris and the cornea

are in apposition with each other. Some of the purulent contents of the vitreous space may be seen projecting into a rent in the middle of the cornea.

6. The other half of the same eye.

J. D., aged 60 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), had the left eye struck, twelve days ago, by a piece of wood ; vision, the next day, was reduced to perception of light ; there was only slight pain. The eye was excised, December 28th, 1859.

7. The lateral half of the sclerotic and cornea of an enlarged eye, the interior of which is occupied by pus and lymph ("acute suppuration of the eyeball"). No choroid can be recognized. Portions of the muscles and orbital tissues are firmly adherent to the outer surface of the sclerotic.

8. The other half of the same specimen.

From a boy (under the care of Mr. Laurence, at the South London Ophthalmic Hospital) into whose eye a needle, mounted in a piece of cane, had been shot. When first seen by the surgeon, the eyeball was enormously protruding. An exploratory incision was made, and about two drachms of thick pus evacuated from the interior of the globe, together with what appeared to be the hyaloid membrane infiltrated with pus. After this, it was considered advisable to remove the globe.

9. A lateral and anterior portion of the tunics of a left eye, with a large rusty piece of brass imbedded in inflammatory products thrown out upon the inner surface of the choroid, and surrounded by brownish-grey and opaque, thickened, and detached shreds of retina. The choroid and sclerotic are in apposition, and much thickened by inflammatory changes.

No particulars could be obtained of the history of this case. On examination when recent, the cornea was milky; the eye large; much of the orbital tissue adherent to the outer surface of the sclerotic, as is frequently observed in acute suppurations of the interior of the eye. The crystalline lens and vitreous substance were missing. A large rent existed at the margin of the cornea in the ciliary region. The œdematous and thickened sclerotic and choroid were in apposition.

10. A lateral portion of a left eye, showing, near the ciliary processes, a blackish piece of metal, surrounded by pus, lymph, and by yellow and opaque portions of retina. Neither the lens nor the vitreous was found. The brown choroid and the sclerotic are in apposition.

11. The other portion of the same eye. The grey-white, opaque substance in the ciliary region is a portion of the displaced retina, together with inflammatory products, which are thrown out upon the ciliary processes.

W.W., aged 46, a smith (under the care of Mr. Poland, Royal London Ophthalmic Hospital), injured the left eye, six weeks ago, by a piece of iron perforating it, while he was working at a boiler. Vision was destroyed at once; a few hours later inflammation set in, which for two or three days was but slight; the fourth day it increased, with pain over the left side of the head, neck, and between the shoulders, and with profuse lachrymation of both eyes. On the same day, photophobia and inability to look at objects appeared in the right eye; the patient observed in the left (blind) eye beautiful colours; these disappeared a week before excision, which was performed June 1st, 1861.

Dissection of the eye.—Shape normal; tension diminished. Optic nerve normal. Cornea drawn inwards towards the anterior chamber along a linear cicatrix, extending from its periphery towards the centre; a nodule of lymph projected through the lower part of the cornea; similar nodules filled the anterior chamber, and occupied the anterior surface of the iris. The lens and vitreous absent. Retina detached from the choroid, strongly translucent. Upon the lower ciliary region, in the vitreous space, was found a rough, flat, hard substance, of the size of a pea, surrounded by blood and pus. The entire area of the vitreous space situated within the ora was occupied by pus; the ciliary muscle appeared œdematous, the ciliary processes not infiltrated with pus.

Microscopic sections from the above eye.—Slide 1. Parallel sections of the optic nerve from the scleral, choroidal, and retinal apertures; the pigment of the choroidal aperture is well seen; the optic nerve has a dirty-grey granular appearance; the loculi of the connective tissue are large, as if many of the nerve-fibres had been destroyed.

12. The inferior half of the tunics of a somewhat shrunken and irregularly shaped right eye; the section is carried through the optic nerve near its middle, and parallel with the nerve-fibres. The sclerotic is much thickened, especially round the optic nerve, and is in apposition with the deep-brown choroid; there is abundance of stellate pigment. The retina is folded, greyish white, and opaque; it was, when fresh, strongly translucent, and in apposition with the choroid. The lens has been removed.

A. W., aged 8 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy boy, of fair complexion, had the right eye injured by an arrow, about eleven months ago. Vision was at once reduced to perception of light. Three weeks after, the eye became completely blind; it has continued to decrease in size; has never been painful. There was much lachrymation until three months ago; none since. Three weeks after the injury, dimness of vision and photophobia of the left eye came on. The right eye was excised, November 16th, 1861.

Dissection of the eye.—Shape irregular; shrunken to one-third its normal size. Cornea greyish-translucent; anterior chamber small. Iris blue; pupil closed by an opaque membrane. The tunics of the eye in apposition with each other; the anterior part of the capsule of the lens adherent to the uvea; the posterior part, together with the hyaloid fossa, thickened, grey, and opaque. The lens itself grey and opaque, containing earthy matter. Vitreous space occupied by transparent fluid. See description of preparation for the other morbid changes.

13. A lateral posterior portion of a right eye, the section being carried through the middle of the optic nerve. The sclerotic and the brown choroid are in apposition. The retina is greyish, strongly translucent, and in some places detached from the choroid, and thrown into delicate folds. A bright yellow elevation of its substance may be observed near the optic nerve; this is the yellow spot.
14. The opposite portion of the same eye, preserved in pyroxylic spirit and water. The retina has become white and opaque. There is a considerable projection of the optic nerve at the retinal aperture.
15. An anterior and lateral portion of the tunics of the ciliary region of the same eye, together with some retina and cornea. A line of brown pigment (a eicatrix) is seen passing through the entire thickness of the cornea, near its margin. The iris is in apposition with the cornea, and, together with the surrounding parts, much reduced in size, from shrinking of the eye.
16. The other half of the anterior portion of the same eye, the section being carried through the middle of the cornea. A small portion of the nearly black choroid is seen; the remainder is hidden by the yellowish-white and opaque retina and the suspensory ligament. A thick layer of pus and lymph is thrown out round the iris.

A. P., aged 10 (under the care of Mr. George Lawson, Great Northern Hospital), a healthy boy, with hazel eyes, struck the right eye, three months ago, while chopping a piece of wood. Vision was at once reduced to perception of large objects; numerous light stars were noticed in the eye for fourteen days after the injury; inflammation and pain continued ever since, though leeches and other antiphlogistic remedies were applied. Eleven weeks after the injury, the left eye began to suffer from lachrymation, photophobia, and slight inflammation. The right eye was excised on the 15th of August, 1861.

Dissection.—The globe small, and irregularly shrunken; tension diminished. Optic nerve

normal, large, yellowish white, and opaque. Cornea transparent; a cicatrix near its lower margin, into which the closed pupil was drawn; this cicatrix extended backwards into the ciliary region, passing through the tunics of the eye. Crystalline lens missing; its capsule and the adjoining hyaloid fossa thickened and opaque. Vitreous space:—within the area of the ora serrata it was occupied by yellowish-tinted vitreous substance, mixed with clots of blood; transparent yellowish fluid occupied the area of the retina. A fold of displaced retina, extending from the lower margin of the retinal aperture to the nearest point of the ora serrata, projected into the vitreous space; this fold was strongly translucent, and slightly greyish; the remainder of the retina was in apposition with the choroid, and almost transparent. Numerous small hæmorrhagic points were seen along the retinal blood-vessels, near the retinal aperture; the vessels were large and numerous. The intraocular part of the optic nerve was swollen, so as to project considerably beyond the retinal aperture.

17. An anterior lateral portion (ciliary region) of the tunics of a left eye, together with some cornea. A portion of iris is adherent (anterior synechia) to some morbid deposit in the cornea. The corresponding part of the crystalline lens has been removed; the ciliary processes, the black uveal surface of the iris, and the ora serrata are well seen.
18. An anterior lateral portion (ciliary region) of the tunics of the same eye, together with some cornea and lens, preserved in pyroxylic spirit and water. The membranes and deposits lining the inner surface of the choroid and the ciliary processes have become white and opaque. The contours of the ciliary muscle are well marked by the surrounding black line of pigment.
19. A posterior lateral portion of the tunics of the same eye, the section being carried through the margin of, and parallel to, the optic nerve. The retina is strongly translucent. The vasa vorticosa can be faintly recognized among the brown choroidal pigment. The small deep-brown portion of the choroid near one of the margins of the preparation is the region of the yellow spot.
20. The corresponding half to the last specimen. The greyish translucent retina has in greater part become detached from the brown choroid; the latter has, during dissection, been torn, and the pigment disturbed along one of the margins of the preparation. A portion of the white and opaque optic nerve may be seen attached to the tunics.

B. F., aged 22 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a

healthy woman, of dark complexion, received a blow on the left eye twelve months ago, which left "a speck on the eye, with slight impairment of sight," and about six weeks later was followed by a spontaneous attack of inflammation of the eye; frequent attacks have occurred since then, accompanied by lachrymation, and severe pain in the eye and in the corresponding temple and forehead. "The speck gradually covered the whole sight." The right eye sympathized. The left eye was excised, August 2nd, 1861.

Dissection.—Tension diminished. Size large. Shape, oval from before backwards, and enlarged laterally (between the outer and lower, and the inner and upper, recti muscles). Optic nerve normal. The place of the cornea occupied by soft grey and opaque fibrous tissue, and by a red vascular nodule (of lymph?) projecting from this. Crystalline lens transparent, in apposition with the cornea. Vitreous space much enlarged; its central portions occupied by viscid, transparent fluid, and its peripheral parts by vitreous substance. The tunics in apposition with each other. Retina transparent. Choroid brown; light- and dark-brown pigment-patches were observed in it, near the choroidal aperture, the results of former inflammation.

21. The lateral halves of the anterior portion of a slightly shrunken left eye. The section is carried through the middle of the cornea, and through a lacerated wound near its lower margin. The yellowish-grey and opaque substance in the interior of the eye consists of pus and fibrin. The position of the ciliary processes is indicated by dark-brown and black lines. The rent in the cornea is seen extending into the fibrin upon the posterior surface of the iris. The sclerotic is unequally thickened; neither lens nor vitreous substance was found.

From a patient of Mr. Streatfeild, who had the left eye injured about a fortnight ago by a piece of copper perforating the tunics in the ciliary region near the lower margin of the cornea. No further particulars could be obtained. The eye was excised, May 23rd, 1859.

Dissection.—Shape irregular. Cornea translucent; one-third of its periphery was separated from the sclerotic by a lacerated wound. A large quantity of lymph was found upon the posterior surface of the iris (which, likewise, was separated from its ciliary attachment) and in the area of the ciliary processes. While shrinking, the lymph appears to have drawn in the scleral margins of the wound. Crystalline lens and vitreous substance missing. Retina grey opaque, detached from the choroid and thrown into folds. Sclerotic and choroid in apposition; the former was irregularly thickened and shrunken, the latter had a deep-brown colour. The inner surface of the ciliary processes was obscured by fibrous tissue.

22. The lateral half of a slightly shrunken eye, the section being carried near the middle of the optic nerve and parallel with its nerve-fibres. The lens has been removed; the iris is almost in apposition with the cornea; the choroid

has in several places become somewhat detached from the sclerotic along the line of section; its epithelium having in some parts been removed, its grey-white and opaque colour is seen. The retina is yellowish white and opaque; it is detached from the choroid, except at the retinal aperture and along the ora serrata; within it is seen the vitreous (a delicate, opaque, flocculent, and membranous substance), and in this, near the ciliary processes, is a circumscribed accumulation of pus (abscess in the vitreous space).

From a patient of Mr. Bowman (Royal London Ophthalmic Hospital), who had the eye injured a few weeks ago. No further particulars could be obtained. The left eye was excised, September 10th, 1860.

Dissection.—Shape globular. Cornea smaller than natural, translucent. Anterior chamber small. Crystalline lens missing. Optic nerve normal. Sclerotic and choroid in apposition. Part of the ciliary processes are drawn into a cicatrix which runs through the tunics of the ciliary region; the adjoining portion of the ciliary muscle appeared larger than natural. For further particulars see description of preparation.

23. A lateral half of the anterior portion of a slightly shrunken left eye, which had been injured by a small shot passing into it at the outer and lower margin of the cornea. The section is carried through the injured part, showing the peculiar curve which the cornea has assumed in consequence of its margins being drawn towards the cicatrized wound. Portions of brown choroid and folds of the displaced yellow and opaque retina remain attached to the ciliary portion of the sclerotic.

24. The opposite half of the anterior portion of the same eye. The retina and choroid are seen to be displaced and drawn towards the cicatrix in the ciliary region.

S. P., aged 13 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a fair, healthy boy, six months ago received a shot in the left eye, from a distance of about thirty yards. The moment the eye was struck, four or five fiery balls appeared to fly about in it; vision was at once reduced to perception of light opposite the inner (nasal) part of the retina, and, after another week, was entirely lost. A severe pain was felt at the back of the eye; three hours after the injury, it extended over the whole of the orbit, and continued for five weeks. The patient states that he fainted for five days successively at the time at which he had received the shot. For three months the eye remained quiet, when the pain recommenced, sometimes appearing every day for two or three hours; the last fourteen days it was

continuous, extending over the branches of the fifth nerve of the left side. The eye appeared always bloodshot, and was said to have become larger and smaller at times, with and without pain. The right eye began to sympathize fourteen days after the injury to the left, as evidenced by lachrymation, photophobia, and inability to fix objects. It felt most weak whenever the left eye was painful. The left eye was excised, December 12th, 1860: a few days after excision, the right became useful again.

Dissection.—Tension moderate. Eye smaller than normal, and slightly squared. Cornea transparent; a small opacity near its lower margin, where it is probable the shot entered. Anterior chamber full of blood. Optic nerve normal. Crystalline lens missing. A fibrous opaque cord extended from the opacity in the cornea, across the vitreous space, to the region of the yellow spot, thence passing through the tunics of the eye, and probably indicating the track of the shot across the eye. Ciliary muscle œdematous. Sclerotic and choroid in apposition with each other. The lamina fusca was very œdematous. The choroid had a deep-brown colour; its inner surface in some places appeared sprinkled with small (colloid?) granules; it was perforated in the region of the yellow spot; the ciliary portion was swollen. Retina in apposition with the choroid in some places, detached from it along the fibrous cord indicating the probable course of the shot, and dragged into the vitreous space, where, detached, it was yellowish and opaque, puckered up, and sprinkled with blood-spots, elsewhere strongly translucent. Yellowish transparent fluid occupied the space between the choroid and detached retina. In the area of the ora serrata the vitreous substance was mixed with blood-clots from the ciliary processes; in the retinal area it was yellowish.

Microscopic sections illustrating this specimen.—Slides 1 & 2. Transverse sections of detached retina, showing also a clot of blood in the vitreous space; the fibres of the framework are elongated, some more, others less, which gives them a festooned appearance.

Slides 3–8. Transverse sections of the retina across a cicatrix in its substance. It is, in many places, reduced to one-third its normal thickness, the rods and more or less of the retina being destroyed, and their place generally occupied by a granular effusion from the choroid. The rods are destroyed everywhere; the optic nerve-fibres are perceptible, and, in a few places, the granules; the fibres of the framework are distorted, forming numerous empty lacunæ.

Slides 9–11. Portions of retina, choroid, and sclerotic. Numerous black pigment-masses may be seen in the retina and sclerotic, which appear to have been torn off from the choroid while the shot was passing through it.

Slides 12 & 13. Transverse sections of the optic nerve at the scleral, choroidal, and retinal aperture. The bundles of optic nerve-fibres and the individual fibres can be recognized; the stellate pigment at the choroidal aperture, the central vessels, and connective tissue are well seen.

Slides 14–16. Portions of choroid. The stellate pigment of the choroid is a light-brown colour, the cells of the choroidal epithelium are filled with deep-brown granules. The elastic lamina and the choroidal vessels can be recognized.

Slides 17–28. Parallel sections of the retina at one-twentieth of an inch from the ora serrata. The thickness of the retina is in many places reduced to one-half its normal size. The rods are destroyed everywhere, and the fibres of the framework are in many places de-

stroyed and elsewhere distorted, so as to form *lacunæ*, most of which are empty, though some contain retinal granules. The inner *membrana limitans* and the optic nerve-fibres are perceptible.

Slides 29 & 30. Parallel sections of the ciliary processes, showing the black pigment and the empty blood-vessels, also the ciliary muscle, which appears as if its fibres were inserted round the ciliary blood-vessels, and have some connection with the suspensory ligament of the lens.

25. The lateral half of an irregularly shaped and considerably shrunken right eye, the section being carried through the optic nerve and parallel with the nerve-fibres. No vitreous substance or lens was found. The brown choroid and the folded and unequally thickened sclerotic were in apposition. There is a large rent in the tunics of the ciliary region, near the margin of the cornea; this rent, which had cicatrized, reopened after excision. The yellowish-white, opaque, and flocculent substance in the interior of the eye is the retina, funnel-shaped and displaced.

26. The corresponding half to the last preparation. The displaced retina has been torn off from near the optic nerve. The anterior chamber is very small; and the place of the iris is occupied by thick fibrous tissue.

W. R., aged 28 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), had the right eye injured two months ago by a "large" piece of steel entering it; this was removed, and, with it, the lens and vitreous substance appear to have escaped. Only slight pain and redness followed, until three weeks ago, when these symptoms increased. The left eye, which for two days after the injury felt weak, remained unaffected for another week, when it began to sympathize, the patient being able to read only two or three letters at a time, and experiencing pain and photophobia when facing the light.

The right eye was excised, March 26th, 1860.

It was irregular in shape; shrunken. Cornea transparent, much thickened at the margin which is nearest the wound in the tunics of the ciliary region; its curve was also changed. Anterior chamber small. Chocolate-coloured fluid occupied the space between the choroid and detached retina. The tunics of the ciliary region, near the margin of the cornea, had been perforated, and the edges of the wound, on cicatrizing, had drawn in the adjoining cornea and sclerotic.

27. A lateral portion of a considerably shrunken and irregularly shaped right eye, the section being carried through the margin of the opaque cornea. The irregularly thickened sclerotic and the brown choroid are in apposi-

tion. No vitreous substance is seen; within the choroid is the yellow and opaque, folded, funnel-shaped, displaced retina. The cornea, iris, and the yellowish-white, opaque lens are in apposition with each other; the margin of the latter has been exposed by removing some of the thickened and opaque lens-capsule.

28. The other portion of the same eye. Some of the displaced retina and some of the sclerotic and choroid have been removed.

T. C., aged 13 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a healthy-looking boy, marked with small-pox, affected occasionally with sore-throat and enlarged tonsils; has suffered from granular lids for the last five years. A year ago the right eye, with which he then could see to count fingers, was struck by a hand, and for a week was painful and watering; since then occasional attacks of pain have occurred. The sight of the left eye good.

The right eye was excised, August 25th, 1860.

Its cornea was changed into dense opaque tissue, to which the iris was adherent. The capsule of the lens was thickened and opaque, and adherent to the uvea, papillary margin, and to the cornea. The lens itself was small, chalky, and opaque. Thick, yellowish, transparent fluid occupied the space between the choroid and retina.

Microscopic sections from this specimen.—Slide 1. A section of the optic nerve from the choroidal aperture. The blood-vessels and the bundles of connective tissue of the optic nerve-fibres can be recognized.

29. An anterior portion of a slightly shrunken left eye, comprising part of the cornea, iris, choroid, and retina, and showing near the margin of the cornea a cicatrix, which extends through the sclerotic, across the ciliary muscle and the choroid, to the hyaloid membrane and suspensory ligament. The folded portions of opaque and displaced retina are drawn towards this cicatrix. The choroid is of a deep-brown colour.

From a strong, fair young man (a private patient of Mr. Dixon), whose left eye was injured by a blow seven years ago. Vision became misty at once, and at the end of six months was entirely destroyed by a severe attack of inflammation, which set in three weeks after the injury. A second attack of inflammation occurred in 1857; a third in 1860. Ever since the injury to the left, the right eye has felt weak.

The left eye was excised, November 27th, 1860.

Dissection.—Tension diminished. Shape and size:—tendency to square; perhaps slightly smaller than natural. Optic nerve normal. The periphery of the cornea transparent, its central portion occupied by leucomatous tissue. Anterior chamber good. Pupil dilated,

fixed; its area occupied by the opaque chalky lens, to which the uvea was adherent. Sclerotic rather thick, and in apposition with the pale-brown choroid; the inner surface of the latter is sprinkled with minute granules (colloid globes). Retina œdematous, yellowish grey and opaque, funnel-shaped, and detached from the choroid, except near its aperture, where it was adherent to a fibrous band (which, from the sclerotic, passed across the choroid, and projected into the vitreous space) and to the neighbouring choroid. The space between the choroid and retina was occupied by thick, transparent, yellowish fluid and by blood. The hyaloid fossa was partially thickened and rendered opaque by deposit of fibrous tissue.

Microscopic sections from this specimen.—Slides 1-6. Equatorial and parallel sections of the retina. The rods, the membrana limitans, and the optic nerve-fibres are destroyed; the fibres of the framework are distorted, bent, forming lacunæ of different sizes, which were empty. Few granules can be seen.

Slides 7 & 8. Portions of choroid. The stellate pigment, the vasa vorticosa, and the capillaries can be recognized: the elastic lamina is almost deprived of its epithelium, and is sprinkled with clusters of black pigment-granules.

30. The lateral half of a slightly shrunken left eye, the section being carried through the optic nerve. The retina is greyish white, opaque, funnel-shaped, and detached from the choroid. The brown choroid, though somewhat retaining its curve (through filaments of the so-called lamina fusca and of the ciliary nerves passing to it from the sclerotic), is in great part detached from the sclerotic. The light-brown and the black patches in the choroid, near the optic nerve, indicate the situation in which a foreign body (a small portion of metal loosely floating upon the choroid) was found. On the ciliary portion of the choroid may be observed a grey-white and opaque inflammatory deposit; and a band of similar colour extends from the closed pupil into and through the irregularly curved cornea. The ciliary muscle has a fibrous opaque appearance.

31. The other half of the same eye. A large portion of the funnel-shaped, displaced, and opaque retina has been removed.

J. P., aged 7 (under the care of Mr. Dixon, Royal London Ophthalmic Hospital), a healthy, fair boy, had his left eye struck, four months ago, by a piece of a percussion-cap. Vision was at once reduced to perception of light; the eye has been inflamed and painful, more or less, ever since. The pain used to come on suddenly when the child was lying down, and to extend over the corresponding side of the head, and was so severe that the "patient could not bear to have his hair touched;" it was much relieved by leeches. Lately the eye has been

getting smaller and softish. Patient says, it appeared to him as if two black-beetles were in the eye. The right eye has suffered from photophobia since the injury.

The left eye was excised, June 13th, 1861.

Dissection.—Tension diminished. Optic nerve normal. Cornea transparent, except at the centre, which was occupied by a round, well-defined, yellowish, and opaque spot. Anterior chamber small. The crystalline lens consisted of slight, grey, opaque debris in a thickened capsule. A fibrous, opaque tissue connected the latter with the pupil and cornea. Retina funnel-shaped, and detached from the choroid; it folded out easily. Yellow, transparent, very adhesive fluid occupied the space between the choroid and retina.

Microscopic sections prepared from this specimen—Slides 1-3. Parallel sections of the retina. The rods appear to have shrivelled up, their place being occupied by an obscure, granular layer. The outer and inner limitans, the fibres of the framework, the two granular layers, and the parallel optic nerve-fibres can be seen.

32. The lateral half of a slightly shrunken right eye, the section being carried through the optic nerve and parallel with its fibres. The choroid is deep brown, and has in several places, between the middle of the eye and the ciliary processes, become detached from the sclerotic. The grey, opaque, funnel-shaped, and delicately folded membrane, which extends from the optic nerve to the ora serrata, is the retina. No vitreous substance or lens was found. Across the ciliary region and the margin of the cornea a deep cicatrix may be observed. The curve of the cornea is much altered.
33. The other half of the same eye. Some of the retina has been removed from near the ora serrata. The yellow spot is distinctly seen in the retina, near the optic nerve.

C. D., aged 14 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), had the right eye struck, three months ago, by a piece of a bursting bottle of ginger wine. Pain in the head and redness of the eye were noticed for two days after the injury; none since. The eye became soft and smaller: vision was destroyed at once. The left eye felt weak for a few days, but soon recovered and remained well.

The right eye was excised, June 22nd, 1861.

It was somewhat shrunken, though of a good shape. Cornea transparent. The retina was strongly translucent.

Microscopic sections from this preparation.—Slides 1 & 2. Oblique sections of the optic nerve from the scleral aperture. The bundles of optic nerve-fibres are of normal thickness. The connective tissue and the blood-vessels appear healthy.

Slides 3-7. Parallel sections of the retina from an equatorial portion. No rods can be

perceived; an obscurely granular and dark yellowish substance occupies their place. The outer and inner limitans and the fibres of the framework, the granulated layer and the inner retinal layers, and the bundles of the optic nerve-fibres are perceptible.

34. The upper half of a somewhat shrunken left eye, the section being carried through the optic nerve and parallel with its fibres. The funnel-shaped, yellowish-white and opaque substance is the detached retina. No vitreous substance was found; the lens has been removed. The cornea, the iris, the tips of the ciliary processes, and a thick grey and opaque membrane separating the former from the detached retina may be observed. The thickened sclerotic and the choroid are in apposition; the inner surface of the latter, in the anterior half of the eye, is brown; behind it is grey and opaque.

T. B., aged 41 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy man, with hazel eyes, lost the vision of the left eye suddenly, fifteen months ago, by wounding it with a piece of iron, which flew off a chisel. Numerous attacks of inflammation, pain, and lachrymation ensued, accompanied for the last six months by shrinking of the eye. The right eye suffered from photophobia and lachrymation, and was unable to fix objects when the left was painful. These symptoms were mitigated by strong pressure on the left eye and temple.

The left eye was excised, April 12th, 1861.

Dissection.—Tension diminished. Globe small, irregular, flattened from above downwards. Optic nerve normal. Cornea generally translucent, but with a white opaque cicatrix across its middle. Anterior chamber full of blood and fibrin. Pupil closed by a white opaque membrane. In the place of the lens were found grey opaque débris, brownish pigment-particles, and a small piece of rusty iron. A thick, fibrous, and opaque membrane separates the vitreous space from the anterior part of the eye. Retina greyish yellow and opaque, funnel-shaped, detached from the choroid; its outer surface sprinkled with minute blood-spots. The space between the choroid and retina was occupied by slightly turbid brownish fluid and by an abundance of cholestearin crystals.

Microscopic sections from this specimen.—Slides 1 & 2. Parallel sections of the optic nerve, from the sclero-choroidal aperture. The bundles of optic nerve-fibres are atrophic. The stellate pigment of the choroid, the connective tissue, and the blood-vessels are perceptible.

Slide 3. Parallel sections of the retina, about one-tenth of an inch from the outer retinal aperture; the fibres of the framework, the granular layer, and the optic nerve-fibres are well seen. Many of the rods are destroyed, others are mingled with pigment-granules; small loculi and lacunæ are observed among the rods; many of the lacunæ extend into the adjoining layer of the retina.

Slides 4 & 5. Parallel sections of the choroid, one-tenth of an inch from the outer choroidal aperture. The vasa vorticosa are very large, containing much blood, serum, and a

few corpuseles. The stellate pigment is of a light-brown colour; the choroidal epithelium is much disturbed, its cells being thrown together into clusters.

Slides 6-8. Parallel sections of the optic nerve, from the scleral, choroidal, and retinal aperture. The bundles of nerve-fibres are cut transversely; in some places they appear healthy. The optic nerve was slightly excavated. No rods are perceptible; they appear to have been destroyed by an exudation from the choroid. In other respects the retinal elements appear healthy, and, together with the choroidal vessels and the pigment, are well seen.

Slide 9. Parallel sections of the optic nerve, from the scleral aperture, showing the connective tissue and the bundles of optic nerve-fibres.

35. The lateral half of a somewhat shrunken right eye, showing a funnel-shaped detachment of the yellow and opaque retina from the choroid. No vitreous substance or lens was found. The sclerotic and choroid are in apposition; the inner surface of the latter is covered with a greyish white and opaque substance from which numerous grey, opaque, and delicate filaments and laminae may be seen passing to the outer surface of the detached retina. The iris is adherent to the opaque cornea; the ciliary processes are hidden by a deposit similar to the one upon the choroid, and by folds of detached retina.

The section is carried through the optic nerve near its middle.

J. L., aged 73 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), states that, in 1853, a small shot, passing the eye, hit the outer canthus, and took vision away at once. Sparks of different colours frequently appeared in the eye, lasting from one to two minutes. The eye remained painless until a few weeks ago, when it became inflamed spontaneously; severe pain was felt in it and along the branches of the fifth nerve. The inflammation was relieved by leeches. The left eye did not sympathize.

The right eye was excised, October 18th, 1859.

Dissection.—Shape globular. Size smaller than natural. The place of the cornea occupied by grey and opaque tissue, with which the iris was in apposition. A large quantity of grey and opaque tissue occupied the place of the crystalline lens. Vitreous missing. Retina detached from the choroid, funnel-shaped, thrown into folds, grey, and opaque; minute black pigment-patches were attached to its outer surface. The optic nerve appeared healthy; the brown colour of the choroid was obscured by a thick grey and opaque deposit upon its inner surface, consisting of calcareous matter and fibrous tissue; grey and opaque shreds and membranes and transparent fluid occupied the space between choroid and retina.

Microscopic section from this eye.—Slide 1. A section of the retina and ora, showing the choroidal epithelium, the ora, and the fibres of the vitreous humour.

36. An anterior lateral portion of a right eye, showing a total absence of the vitreous, with complete displacement of the retina. The sclerotic and the brown

choroid are in apposition. A portion of translucent crystalline lens may be seen behind the cornea, and immediately posterior to this is a yellow and opaque substance, which is the displaced retina pushed forwards upon the hyaloid fossa.

37. The opposite half of the same eye, preserved in pyroxylic spirit and water. The portion of the lens has been removed, so as to show the empty cavity of its capsule.

J. T., aged 16 (under the care of Mr. Bowman, Royal London Ophthalmic Hospital), a healthy boy, of dark complexion, in October 1860, while engaged at harness-work, ran an awl into the right eye. Vision seemed destroyed for a day; on the second, third, and fourth day perception of light returned, which ceased after the fifth day; inflammation, commencing the same day, continued for four weeks. Fourteen days ago a second attack of inflammation came on, with much lachrymation and pain, not in the eye, but in the eyebrow and corresponding side of the head. Photophobia and lachrymation appeared in the left eye directly after the injury to the other, and has continued ever since.

The right eye was excised, December 14th, 1860.

Dissection.—Tension diminished. Optic nerve normal. Cornea transparent; the pupillary margin drawn towards, and adherent to, a cicatrix near the inner margin of the cornea. Iris almost in apposition with the cornea. Area of the pupil clear; deep behind it (seen through the transparent lens) a yellow reflexion was observed. The sclerotic and choroid were in apposition; the latter had a brown colour, which was deeper in some than in other places; it was œdematous near the ciliary muscle, which appeared enlarged. Crystalline lens transparent; the iris was adherent to the lens-capsule. Retina funnel-shaped, detached from the choroid, greyish white and opaque, on its outer surface sprinkled with red spots. This opaque and displaced retina was the cause of the yellow reflexion seen from behind the pupil; blood, almost pure, occupied the space between the choroid and displaced retina. No vitreous was found.

Microscopic sections from this specimen.—Slides 1–3. Transverse sections of the optic nerve, from the sclero-choroidal aperture. The connective tissue, its circular fibres, and the blood-vessels of the optic nerve can be recognized. The optic nerve-fibres, as well as the stellate pigment of the choroidal aperture, appear healthy.

Slides 4 & 5. Oblique sections of the choroid and retina. The stellate pigment of the choroid is of a deep-brown colour; no pigment is seen among the chorio-capillaris; the latter equals in thickness the choroid. The choroidal epithelium is much changed, and numerous colloid globules project from the elastic lamina into the retina. The retina has one-third its normal thickness; no rods and no retinal elements can be recognized; the fibres of the framework form empty loculi; the optic nerve-fibres are perceptible.

Slide 6. Portions of choroid, showing the loss of transparency of its substance. There is very little stellate pigment, and the epithelium is much disturbed.

38. The lateral posterior portion of a shrunken left eye, the section being carried through the middle of the optic nerve and parallel with its nerve-fibres. The grey, translucent, delicately folded membrane which projects from the optic nerve into the eye is the retina, which has become detached from the choroid. The latter is deep brown, and in apposition with the sclerotic; portions of its epithelium have been accidentally scraped off near the margin of the section.
39. A lateral portion of the anterior half of the same eye. The section is carried through a cicatrix near the middle of the cornea, by the contraction of which the normal curve of this part has been destroyed. Neither iris nor lens was found; the lens-capsule and some of the ciliary processes are drawn towards the cicatrix and the inflammatory products surrounding it. The sclerotic and choroid are in apposition. Folds of the detached and almost transparent retina may be seen projecting from the ora serrata.
40. The corresponding section of the same eye. The cicatrix, the irregular curve of the cornea, and the displacement and adhesions of the suspensory ligament of the lens-capsule, of some of the ciliary processes, and even of some retina to the cicatrix, are well seen.

S. D., aged 32 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy man, of fair complexion, had the left eye wounded, a month ago, by a piece of iron flying into it. Vision was lost at once, and the eye became smaller immediately, with much pain in it and in the corresponding temple. Photophobia and lachrymation commenced, the following day, in the right eye.

The left eye was excised, August 27th, 1861.

Dissection.—Tension diminished. The eye smaller than natural. Cornea uneven, drawn towards the anterior chamber by a cicatrix which extended through its thickness and adhered to some fibrous tissue occupying the area of the pupil. Optic nerve normal. Iris in greater part implicated in the cicatrix; the ciliary processes and the capsule of the lens were likewise drawn into the cicatrix. Sclerotic and choroid *in situ*; the latter had a deep-brown colour. Retina funnel-shaped, displaced, strongly translucent; its outer surface sprinkled with red spots. Transparent fluid occupied the space between the choroid and retina.

41. The anterior half of a left eye. On the external surface, in the ciliary region, near the margin of the flat and opaque cornea, a cicatrix may be seen. On

the inner side the brown choroid and the sclerotic are in apposition; the ciliary region of the latter is hidden by a considerable grey and opaque inflammatory deposit. The yellowish-grey and opaque substance which projects from the middle of this deposit is part of the retina, funnel-shaped and displaced.

C. V., aged 30 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), states that eleven years ago he had a blow on the left cheek from a piece of iron, which also "scratched" the eye. Vision was at once impaired (he could tell the time on a large clock, but could not see to read), and after six days completely lost. He noticed that the nasal part of the retina became paralysed last; redness, and pain in the eye and over the branches of the fifth nerve were severe for twelve weeks; since then the eye remained quiet until two years ago, when it appeared to suffer frequently from dust flying into it, which caused it to become red and painful. While the left eye was inflamed, vision of the right was misty, with photophobia and inability to fix objects for any length of time; the latter symptoms subsided, but vision remained slightly misty. For the last ten months numerous small golden globules have been noticed floating before the right eye for three or four minutes, increasing in frequency of late, especially at night. There was no pain or redness; but a tightness of the eyelids was complained of. The left eye was excised, November 6th, 1860.

Microscopic sections from this eye.—Slides 1 & 2. Parallel sections of the retina, showing the retinal vessels, clusters of chalk-deposits in the retina, and the normal thickness of the layer of optic nerve-fibres. No other elements of the retina can be recognized.

Slide 3. Transverse sections of the retina, showing the retinal blood-vessels and the optic nerve-fibres. The fibres of the framework and the regularity of the granules are much disturbed by the deposit of chalk-molecules.

Slides 4–8. Portions of choroid from the posterior half of the eye, showing the deep-brown-coloured stellate pigment of the vasa vortices and the ciliary nerves. The choroidal epithelium is nowhere healthy; in many places it is entirely absent, as if clusters of cells had fallen out, in other places clusters of granules are left; besides this, there are seen projecting from the inner surface of the choroid, grey and opaque globular bodies (colloid globes); many of these appear to have caused the roundish holes of the choroidal epithelium.

42. The lateral half of the anterior portion of a left eye, showing a thinning of all the tunics, with a considerable enlargement of the cornea, which retains its curve, and a similar enlargement of the iris, without apparent thinning of its uveal pigment. The slightly opaque lens-capsule is kept expanded by adhesions between it and the iris, occluding the pupil, and by the morbid changes of the hyaloid fossa and of the adjoining vitreous space. The grey opaque substance behind the hyaloid fossa, and occupying the area of the ciliary processes, consists of inflammatory products, of vitreous sub-

stance, and of retina, all changed, displaced, and adhering together. Some portions of the posterior chamber are much enlarged. Part of the greyish-yellow and opaque lens lies at the side of the preparation.

The other half of this specimen is in the Museum of the Royal London Ophthalmic Hospital.

E. R., aged 17 (under the care of Mr. Wordsworth, Royal London Ophthalmic Hospital), a healthy man of fair complexion, states that when one year old a spark of fire touched the left eye, impairing vision; but that there had been good perception of light until July 1860, when the operation of division of the ciliary muscle was performed elsewhere, once in the lower and once in both upper and lower ciliary region. Vision was entirely lost after the first operation, and the eye became smaller. Last Christmas, while skating, the eye became inflamed, watering, and painful; these symptoms are increasing. Since the inflammation of the left eye, the right has suffered much from lachrymation, photophobia, and inability to fix objects for any length of time. The left eye was excised, January 25th, 1861.

Dissection.—The eye was large and elongated. The optic nerve had a grey-pink colour. Cornea enlarged, transparent. Anterior chamber large. Iris dirty greenish yellow. The yellowish opaque lens floated loosely behind the pupillary area. The sclerotic and choroid were in apposition; the former was very thin throughout.

Microscopic sections prepared from this eye.—Slides 1 & 2. Portions of choroid, showing the light-brown stellate pigment, the healthy choroidal epithelium, its cells being filled with grey opalescent granules; the other portion showing the ciliary nerves, the arteries, and the stellate pigment attached to the former.

Slides 3 & 4. Transverse sections of the optic nerve, from the sclero-choroidal aperture. The central blood-vessel is large, and has been ruptured, the blood escaping among the atrophic portions of the nerve; the connective tissue can be recognized. The bundles of optic nerve-fibres are extremely small.

43. The lateral portions of the anterior half, and a lateral part of the posterior half of the tunics of a right eye. The section is carried through the middle of the optic nerve, parallel with its nerve-fibres, and through a cicatrix in the sclerotic near the margin of the cornea. Neither lens nor vitreous is present. The grey opaque and folded membrane which projects from the optic nerve into the interior of the eye is the retina, which has become detached from the brown choroid. The ciliary processes are hidden from view by opaque portions of displaced retina, and by opaque inflammatory products thrown out upon their inner surface.

44. The opposite portion of the posterior half of the same eye, preserved in

glyccrine. The vasa vorticosa and the insular arrangement of brown choroïdal pigment are well seen. The optic nerve in the area of the retinal aperture is cupped; near it may be seen the straw-coloured tint of the yellow spot.

J. J., aged 39 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), suffered while going to school from asthenopia ("the letters swam together when he read for any length of time"); this disappeared as he grew older. Similar symptoms are observed in the left eye since the right was injured. The latter was, on the 11th of January, 1861, struck by the horn of a bullock; a flash of fire was observed at the time, followed immediately by loss of vision, except perception of light; three weeks later all vision had gone; since then, blue and green flashes of light are occasionally noticed in the eye, chiefly at night. The eye has been inflamed and watering ever since; and there has been continual pain, not in the eye, but in the adjoining part of the forehead. The left eye sympathizes more since the right has been blind; lachrymation, photophobia, and inability to fix objects are severe.

The right eye was excised, November 19th, 1861. Upon examination, it appeared enlarged laterally. The optic nerve normal. The cornea transparent: the upper half of the anterior chamber was occupied by blood; the lower by a yellowish-grey and opaque tissue. Iris missing. Crystalline lens yellowish grey and opaque; its periphery sprinkled with chalky patches. Sclerotic and choroid *in situ*; a bluish line across the upper ciliary region (running parallel with the margin of the cornea) appeared due to a former rupture of the tunics. The choroid had a deep-brown colour. Of the vitreous, a small quantity was found immediately behind the hyaloid fossa, the remainder was missing. Retina funnel-shaped, displaced, yellowish grey, and opaque; on its inner surface were a few blood-spots.

54. The greater part of a left eye, showing a displacement of the yellowish-white and opaque lens towards the ciliary processes, and a detachment of the greater part of the yellowish-white and opaque retina from the choroid. No vitreous is present. The sclerotic and the brown choroid are in apposition. There is a grey opaque fibrous deposit upon the ciliary processes, commencing along the ora serrata, a considerable thickening of the hyaloid fossa, and a fibrous substance projecting from the sclerotic across the choroid and retina into the vitreous space. The section is carried through the optic nerve near its middle.

J. W., aged 31 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a man of fair complexion, and apparently healthy, but who is said to have suffered from palpitation of the heart from the age of twenty to twenty-seven. In 1851 a piece of a percussion-cap flew into the left eye, where, as the patient states, it remained for six weeks, when

it was removed, being found lying in the inner canthus. Vision was at once reduced to perception of light, continued to decrease during slight attacks of inflammation, and was entirely lost during a severe attack in 1859. The attacks have become more frequent since; they came on suddenly, and were generally relieved by the bursting of a small vesicular projection in the corneal opacity: this the patient noticed accidentally, and afterwards used frequently to relieve or obviate inflammatory attacks by pricking the projection, allowing some transparent fluid to escape from the eye. The right eye suffered from lachrymation and photophobia, and inability to fix objects, whenever the left was inflamed; for the last eighteen months the flame of a candle appeared surrounded by a halo, and rays of light seemed to radiate from the flame. The left eye was excised, February 23rd, 1861.

Dissection.—Cornea partially transparent, partially opaque, thickened, and staphylomatous. Anterior chamber good. The pupillary margin of the iris adherent to the capsule of the lens. Crystalline lens opaque, and displaced towards part of the ciliary region. The injury appears to have led to a contraction, thickening, and other inflammatory changes of part of the suspensory ligament, thus displacing the lens.

Microscopic sections from this eye.—Slide 1. Parallel sections of the choroid and retina from near the optic nerve, with portions of the sclerotic, choroid, and retinal aperture. The optic nerve is slightly excavated; the thickness of the fibres where they pass upon the retina is much reduced; numerous lacunæ are noticed among the fibres; no rods are perceptible, but the granules and fibres of the framework can be seen. Some kind of exudation upon the inner surface of the choroid occupies the place of the rods.

Slides 2 & 3. Parallel sections of the retina from the region of the yellow spot. The retinal elements have a normal arrangement. The rods are close-set, and of a yellowish tint; the outer and inner granular layer, the fibres of the framework, especially the oblique undulating fibres, are well seen.

Slides 4 & 5. Portions of choroid, showing the choroidal epithelium, the vasa vorticosa, and the light-brown stellate pigment of the choroid.

46. The lateral half of a left eye, in which the vitreous and lens are wanting. The sclerotic and the brown choroid are in greater part in apposition. Shreds of the greyish, translucent, detached retina are seen, one attached along the ora serrata, another round the optic nerve. The iris is in apposition with the cornea.
47. The other half of the same eye. The detached retina is dotted with minute black patches. The lens-capsule is greyish translucent; it is adherent to the iris, and, together with the latter, pressed upon the cornea.

J. H., aged 53 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a smith, a healthy strong man, struck his left eye, six years ago, with a piece of iron. Vision was at once reduced to perception of shadows, and entirely lost a fortnight later, when it

became inflamed for two months. Numerous slight attacks of inflammation, with supra-orbital pain and much lachrymation, ensued, particularly in warm weather. The right eye has suffered from photophobia for the last three months; the glasses, which for twenty years he has worn occasionally while both eyes were used, he has had to wear continually since the left has been lost. The left eye was excised, September 10th, 1861.

48. An anterior portion of the tunics of a right eye, together with the large grey and opaque lens *in situ*; the cornea and part of the iris have been removed. Many of the ciliary processes are in close contact with the margin of the lens. The choroid is deep brown; its inner surface is sprinkled with numerous well-defined black dots and patches. The retina is transparent, except a few circumscribed portions along the ora serrata, which are grey and opaque.
49. A lateral posterior portion of the same eye, the section being carried through the optic nerve and parallel with the nerve-fibres. This shows the slightly cupped or excavated condition of the optic nerve in the retinal aperture. The deep-brown choroid is thickly sprinkled with black pigment-dots and patches, much resembling bone-corpuscles in shape.

R. C., aged 26, an otherwise healthy-looking man, had, in May 1859, an inflammation of the right eye, after paraplegia from a fall eighteen weeks before. The eye was excised, September 20th, 1860.

Dissection.—Shape: flattened from before backwards (a hypermetropic eye). Size smaller than natural. Cornea translucent. Crystalline lens changed into a grey, opaque, and almost fluid substance. Vitreous changed into transparent fluid. The tunics were in apposition. The choroid had a deep-brown colour; its surface was thickly sprinkled with round and semicircular black patches, especially round the optic nerve and in the region of the yellow spot. The optic nerve was slightly excavated, and had a pale pink colour. Retina transparent in some, strongly translucent in other places; its capillary vessels distorted and numerous.

Microscopic sections prepared from this eye.—Slides 1–5. Parallel sections of the retina from the region of the yellow spot. The rods can nowhere be recognized; the outer limitans is seen in some places; the remainder of the framework of the retina can be recognized in most places; its fibres are much elongated and distorted, and the corresponding granules are accordingly displaced. The optic nerve-fibres and the adjoining retina-layers are indistinct, but can be recognized in some places; in others no distinct structure can be made out.

Slides 6–13. Parallel sections of the retina, some with the corresponding portions of the choroid, others with portions of the optic nerve attached to it. The stellate pigment of the choroid has a deep-brown colour; its epithelium is much disturbed, changed into irregular brown and black patches. The optic nerve has its normal thickness; its fibres at the chorio-

retinal aperture are well seen. Many of the retina-sections are carried transversely across the optic nerve-fibres; the rods can only be recognized in a few places; the fibres of the framework are much stretched, and the granules accordingly displaced. The bundles of optic nerve-fibres can be recognized in most places.

Slides 14-21. Parallel sections of the retina and choroid, about one-tenth of an inch from the inner choro-retinal aperture. The choroidal pigment is abundant, and of a deep-brown colour. The epithelium is much disturbed; it consists of clusters of brown granules and of black patches; the hexagonal shape of the epithelium-cells can nowhere be recognized. In many places an effusion may be observed to have passed through the epithelial layer into the retina. Numerous granules of the choroidal epithelium are seen adhering to the adjoining ends of the rods of the retina; these adhesions are firmer at the black patches, where also the stretching of the fibres of the framework is more considerable. The rods are destroyed in most places; the remainder of the framework is perceptible, but much torn, distorted, and stretched; the granules are accordingly displaced. The optic nerve-fibres are well seen. Numerous brown pigment-granules are deposited in the retina.

Slides 22-30. These sections are taken from the same part of the retina as those last described.

Slides 31-34. Parallel sections of the optic nerve while passing through the retinal aperture, and transverse sections of the same while upon the retina; together with portions of the retina. The optic nerve-fibres are well seen, but appear disturbed in their course. No rods can be recognized. The fibres of the framework are stretched and distorted, and the granules accordingly disturbed.

Slides 35-37. Transverse sections of the optic nerve at the scleral aperture. The nerve is in a slight state of atrophy; the connective tissue, including the inner and outer circular fibres, the blood-vessels, the bundles of optic nerve-fibres, and the individual fibres, can be recognized.

Slides 38-44. Parallel sections of the ora serrata and retina, with the corresponding portions of choroid. The stellate pigment of the choroid has a brown colour; many of the so-called ganglions in the choroid may be seen. The epithelium is much disturbed, changed into black and brown irregular patches, many of which adhere firmly to the outer limitans of the retina. The ora-fibres and those of the framework of the retina are considerably elongated; the rods are destroyed; the granules are much disturbed in some, and entirely absent in other places, leaving large lacunæ, which are surrounded by the fibres of the framework; the optic nerve-fibres are perceptible.

Slides 45-47. Parallel sections of the retina and choroid, about one-tenth of an inch from the outer margin of the ora serrata. The deep-brown stellate pigment of the choroid is abundant; many of the so-called choroidal ganglion-cells are seen. The epithelium is changed into brown and black patches, many of which are considerably pushed into the retina; in other places fibrous structure is observed, which, having originated in the choroid, passes through the epithelial layer into the retina. The normal thickness of the retina is everywhere diminished, being, in some places, reduced to one-third; the rods are perceptible. The fibres of the framework are much stretched and disturbed, and the granules accordingly deranged. The optic nerve-fibres are everywhere seen.

Slide 48. A portion of choroid, showing the ciliary nerve, the stellate pigment, and the so-called ganglion-cells.

Slide 49. A portion of choroid, showing the vasa vorticiosa and the stellate pigment.

Slide 50 shows a disturbed state of the choroidal epithelium, which is changed into black pigment-granules.

Slide 51. A portion of retina, its outer surface being sprinkled with the above-mentioned pigment-granules.

Slide 52. A portion of choroid, showing the stellate pigment, together with the large black flakes of choroidal epithelium.

Slide 53. A portion of choroid, showing the vasa vorticiosa, filled with some peculiar yellowish and opaque substance, and the stellate pigment of the choroid.

Slide 54. Portions of the lamina fusca, the ciliary nerves, with some of the choroidal arteries.

50. An anterior portion of the tunics of a left eye, together with the lens *in situ*. The marginal portion of the latter is grey and opaque; its nucleus has an amber colour. The ciliary processes are well marked. The greyish translucent retina has become detached along the line of section. The greater part of the cornea is replaced by opaque tissue, with which the iris (the pupillary area of which bears traces of inflammation) is in apposition.

R. F., aged 45 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy man, had the left eye injured four years ago by a piece of hot iron. Vision was destroyed at once. The eye has continued inflamed and watering ever since, more so when patient was working at the fire; pain in the eye continued for about six months after the injury. The right eye has remained weak since the injury. Patient at last was no more able to work at the fire; and for twelve months has not been able to read.

The left eye was excised. Shape normal. The upper two-thirds of the cornea were opaque and slightly staphylomatous; the lower third translucent. Vitreous healthy. Sclerotic, choroid, and retina appeared normal. The optic nerve was slightly excavated. The region of the yellow spot was well marked in the choroid, but not in the retina.

Microscopic sections prepared from this eye.—Slides 1–3. Parallel sections of the retina from the region of the yellow spot, showing the outer and inner granular layer, the rods, and the oblique course of the radial fibres where they intervene between the outer and inner granular layer.

Slide 4. A portion of some tissue, which passes from the sclerotic through the choroid at the region of the yellow spot; it consists of fibrous tissue mixed with brown pigment, and shows trace of former blood-vessels.

Slide 5. Sections of the optic nerve at the aperture of the sclerotic, choroid, and retina. The choroidal vessels are cut transversely; the optic nerve is deeply excavated; the optic

nerve-fibres and the blood-vessels can be recognized along the walls of the excavation. The granules of the retina may be distinguished near the retinal aperture.

51. The outer lateral half of a somewhat shrunken right eye, the section being carried rather obliquely through the optic nerve. The brown choroid and the sclerotic are in apposition in some, and detached from each other in other places. The sclerotic is much thickened round a cicatrix in the ciliary region. The lens is absent. The iris, ciliary processes, and hyaloid fossa are drawn together by inflammatory products, by which also the small anterior chamber is occupied. The greyish, strongly translucent retina has in some places become detached from the choroid. The choroidal surface of some of the detached portions of retina is sprinkled with pigment-molecules.

52. The other half of the same eye, preserved in pyroxylic spirit and water. The retina and the inflammatory effusions have become yellowish white and opaque.

J. H., aged 11 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy, red-haired boy, had, on November 22, 1860, the right eye cut by a piece of glass, which flew off a bursting glass bottle; the piece fell out. Vision was lost instantaneously; the eye was never painful. The left eye seemed weak for a few days. Seven weeks ago it was scratched by a finger-nail; this was followed by protracted inflammation and photophobia, without pain. The right eye was excised, August 9th, 1861.

Dissection.—Tension moderate. The eye was smaller than natural, and irregularly shrunken; its tunics drawn inwards by a cicatrix, which ran across part of the cornea and the adjoining ciliary region. Cornea translucent, the iris in apposition with it; the pupil implicated in the cicatrix. Lens missing. Vitreous space occupied by transparent yellow fluid.

53. Anterior lateral and posterior lateral portions of the tunics of a left eye. In the former a part of the greenish, opalescent, almost transparent lens may be seen; in the latter the section is carried through the middle of the optic nerve, and parallel with its nerve-fibres. The sclerotic and the deep-brown choroid are in apposition with each other; the apices of the ciliary processes touch the margin of the lens. The retina is greyish, translucent, and thrown into delicate folds; round the optic nerve it is almost opaque and is much thickened.

54. The opposite parts of the same eye. The lens has been removed from the anterior portion.

W. J., aged 26 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy, red-haired man, had his left eye wounded by a chip of iron, three weeks ago; he believes the iron to be still in the eye. Vision remained useful for the three following days, then it became misty; a few days later iridectomy was performed. A grey and opaque reflexion from the vitreous space was noticed after the operation; vision was not improved, perception of shadows only remained; severe pain in the eye, with redness and slight lachrymation, continued, and were not relieved by leeches. The right eye began to sympathize a fortnight after the injury. Minute dancing lights were occasionally noticed in the left eye, particularly when fixing objects with the right. The left eye was excised, November 8th, 1861.

Dissection.—Tension diminished. Shape slightly irregular in the region of the yellow spot. Optic nerve normal. The peripheral portions of the cornea were transparent; the central parts ulcerating superficially. Anterior chamber small. Area of pupil, enlarged by iridectomy, turbid. Crystalline lens normal. Vitreous normal. The tunics *in situ*. The choroid had a mottled deep-brown colour. Retina normal, except in a few equatorial portions, and in the region of the yellow spot and round the retinal aperture; in these places it was sprinkled with small round blood-spots, the adjoining retina being swollen and oedematous; the retinal vessels, some of which ran over these blood-spots, were numerous and tortuous. A large yellow oval patch, surrounded by a silvery and slightly grey and opaque halo, occupied the region of the yellow spot.

55. The anterior portion of the tunics of a right eye, the iris having been removed. Within the area of the grey and opaque apices of the ciliary processes is the large yellow and opaque lens, surrounded by portions of the grey and opaque flocculent vitreous. The opaque retina and the choroid have become slightly detached from each other and from the sclerotic.

W. B., aged 15 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a healthy-looking boy, had some lime thrown into the right eye, three months ago. The eye has been inflamed and painful ever since. The left eye does not sympathize.

The movements of the right eye were much impaired by the adhesions between the palpebral and ocular conjunctiva. The cornea was milky and opaque, and the iris adhered to it.

Microscopic section prepared from this eye.—Slide 1. Transverse sections of the healthy retina, about one-tenth of an inch from the upper retinal aperture, showing the framework, the outer and inner granular layer beneath, the optic nerve-fibres, and the blood-vessels.

56. The lateral portion of a right eye, comprising part of the optic nerve, the tunics, and the lens. The section is carried through the optic nerve, parallel

with its nerve-fibres. The sclerotic and the deep-brown choroid are in apposition. The retina is greyish, translucent, detached from the choroid, and thrown into delicate folds. What remains of the vitreous presents, especially in the area of the ciliary processes, a greyish, cloudy, translucent appearance. The lens and the iris are in apposition with the cornea; the brownish opaque line, which can be traced through the substance of the latter near its margin, is a cicatrix.

A. N., aged 14 (under the care of Mr. Bowman, Royal London Ophthalmic Hospital), a rather delicate boy, of fair complexion, had the right eye injured, four weeks ago, by a piece of percussion-cap flying into it; the eye was bloodshot for a few hours, and soon free from pain. Vision was at once impaired. Fourteen days ago patient read No. 18 of Jäger's test-types; the impairment increased slowly, especially opposite the central and outer portions of the retina. The left eye never sympathized. The right eye was excised, April 20th, 1861.

Dissection.—Tension diminished. Shape normal. Optic nerve normal. Cornea transparent. Anterior chamber occupied by slightly turbid fluid. Pupil slightly drawn up towards an incision in the upper corneal margin of the ciliary region. Crystalline lens transparent, globular; its shape changed by being pressed upon laterally by lymph. Ciliary muscle large, œdematous. Sclerotic and choroid in apposition with each other; the latter had a brown colour. A considerable deposit of lymph obscured the ora and the ciliary processes, covered the greater part of the hyaloid fossa, and extended into the adjoining portions of the vitreous. The retina was transparent from its aperture to the middle, translucent from thence to the ora; a part which was detached from the choroid projected as a grey and opaque fold into the vitreous space; this fold corresponded to the part of the ora where the deposit of lymph was most considerable. Vitreous, of normal consistence, occupied the area of the retina.

Microscopic section prepared from this eye.—Slide 1. Portions of choroid, showing the vasa vorticosa filled with blood-serum and healthy choroidal epithelium.

57. The inferior half of the tunics, with some of the vitreous of a right eye, the section being carried through the middle of the optic nerve, and parallel with its nerve-fibres. The retina is strongly translucent, so that the pale-brown choroid is well seen through it; it has become slightly detached from the latter along the line of section. The ciliary processes are well seen. Some blood remains at the bottom of the anterior chamber. The lens-capsule is thickened and opaque, and adherent to the uveal surface of the iris.

58. The other half of the same eye. The vitreous, some of the retina near the ora serrata, and part of the suspensory ligament having been removed, the

choroid and the ciliary processes are much better seen than in the last preparation.

59. The part of the retina and of the suspensory ligament removed from the last preparation. The dark-brown line of pigment indicates the situation of the ora serrata.

E. B., aged 56 (under the care of Mr. Bowman, Royal London Ophthalmic Hospital), a short, thin, healthy woman, had a cataract commencing in the right eye, and soon after in the left eye, about one year ago (she had worn convex glasses for three years). A white earthy deposit was perceptible upon the lower portion of the right lens-capsule. Both the opaque lenses were removed by upper corneal sections; the left lens was larger than the other; some of the soft lens-substance was left behind. All went on well for a fortnight, when, while in the hospital, the right eye spontaneously became inflamed and painful, with pain over the corresponding side of the head; the iris and the aqueous fluid became cloudy, the pupil slightly drawn up, and clogged with lymph. The patient, since the commencement of the pain, complained of a deep-red light in the otherwise blind eye, originating on its nasal side, and spreading all over the eye (this has disappeared since excision). The inflammatory symptoms increased, and the left eye, which was progressing favourably, became weak, and suffered from redness and lachrymation, attended with pain over the left side of the head. The right eye was excised, October 29th, 1861.

Dissection.—Shape normal. Cornea transparent. Anterior chamber filled with blood. Vitreous space occupied by blood-clots, normal vitreous, circumscribed deposits of pus, and by yellowish serum. The deposit of pus was most considerable behind the lens. The choroid had a brown colour. The retina transparent; its vessels gorged with blood.

60. The anterior half of a right eye, the tunics of which are in apposition. The choroid is deep brown (the iris was brown); the ciliary processes are well marked. The lens is *in situ*; its central portions, since the specimen was placed in glycerine, have become silvery and opaque. The pupil is closed, and pressed forwards upon the cornea. Some portions of the retina and vitreous, near the ora serrata, are rendered opaque and thickened by inflammatory changes.

61. The posterior half of the same eye. The retina, along the line of section, has become slightly detached, grey, and translucent. The yellowish-white round optic nerve is well marked off by the surrounding deep-brown choroid. The vasa vorticosa and the stellate pigment of the choroid, which lies be-

tween the vasa and shows a different arrangement in different parts, are well seen.

J. B., aged 59 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy man, of dark complexion, received a blow upon the right eye four weeks ago, which was followed by hypopion, superficial sloughing of the cornea, and by severe pain in the eye and corresponding supraorbital region; these symptoms, which after a fortnight had diminished, recommenced a week ago. The left eye began to sympathize a week after the injury, suffering from photophobia and inability to fix objects; the symptoms were more considerable whenever the pain of the injured eye was great. The right eye was excised. August 20th, 1861.

Dissection.—Tension increased. Optic nerve normal. Shape slightly squared by the resistance which the recti muscles offered to the increased tension. Retina transparent, except the margin of the retinal aperture, which is ill-defined and swollen, and appears to have offered some resistance to the passage of blood through the retinal blood-vessels.

62. The posterior half of a left eye, from which the vitreous has been removed. The sclerotic and the mottled-brown choroid are in apposition; the retina is strongly translucent, and in many places detached from the choroid and thrown into numerous delicate folds. Near the optic nerve (the small, round, white, and opaque dot) may be seen through the retina a circumscribed deeper-brown portion of choroid, which is the region of the yellow spot.

No particulars could be obtained of this case. The cornea had sloughed away, and the iris was exposed. The crystalline lens, vitreous, and tunics were healthy.

63. A portion of the tunics of a left eye from the ciliary region, together with some cornea and iris. The sclerotic is very thin and staphylomatous; but the choroidal pigment still retains a deep-brown colour. The ciliary processes are atrophied.

64. Another portion of the same eye. More of the choroidal pigment has disappeared from the ciliary region than in the last preparation. Portions of calcified lens-substance may be seen upon the uvula, and attached to the almost transparent lens-capsule.

M. L., aged 24 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy woman, of fair complexion, fifteen years ago, cut into the cornea of the left eye with a knife. Vision was at once reduced to faint perception of light, and the eye was inflamed for about six weeks. Numerous slight attacks of inflammation have occurred since the in-

jury, and a continual darting pain has been felt in the corresponding temple and supra-orbital region in winter, and increased when lying down. There have been no flashes of light. More recently the patient has had small-pox, after which all perception of light disappeared. The right eye never sympathized. The left eye was excised, December 22nd, 1860.

Dissection.—The eye was much enlarged, the tunics of the ciliary region being thinned and staphylomatous; the shape of the eye, from the insertion of the recti backwards, normal. Optic nerve grey-white and opaque. Cornea transparent, a cicatrix passing across its outer and lower portions. The papillary margin of the iris adherent to the cicatrix. Anterior chamber small. The tunics in apposition with each other. The lens changed into a fibrous opaque substance, with deposits of calcareous matter in it, occluding the pupil, and adhering to the uveal surface of the iris. Vitreous space occupied by transparent fluid and by débris of earthy matter. Choroid in the ciliary area, though spread over the thinned sclerotic, with abundant pigment, and of deep-brown colour; ciliary processes atrophied. In the retinal area, choroidal pigment of a deep-brown colour; vasa vorticosa well marked. The inner surface of the choroid was sprinkled with black patches (changed choroidal epithelium) and with numerous minute earthy granules. Retina slightly greyish, strongly translucent, and sprinkled with pigment-molecules. The optic nerve deeply excavated.

Microscopic sections prepared from this eye.—Slides 1–8. Parallel sections of the optic nerve, with portions of the adjoining retina and choroid. In some sections the sclerotic, choroid, and retina are separate. The stellate pigment of the choroid appears healthy; its epithelium is perceptible; a slight effusion of blood is seen between the choroid and retina around the retinal aperture. The optic nerve-fibres are destroyed at the margin of the choro-retinal aperture, the optic nerve being excavated: the nerve-fibres are well seen in the excavation. The prominent margin of the cup (choroidal aperture) is occupied by blood-vessels of the choroid.

Slides 9–12. Oblique sections of the optic nerve from the scleral aperture, showing an excavation of the nerve; the parts of the nerve adjoining the walls of the excavation are yellowish and less transparent than the remainder. The connective tissue, the vessels, and the bundles of optic nerve-fibres can be recognized.

Slides 13–18. Transverse sections of the retina, about one-fourth of an inch from the inner retinal aperture. Its thickness is from one-third to one-fifth less than normal, and its general appearance is as if it had been compressed considerably; no rods can be recognized. The framework of the retina, the granules, and the optic nerve-fibres are perceptible; their arrangement is much disturbed. The clusters of pigment-granules are pushed into the retina, together with numerous colloid globules.

Slides 19–29. Parallel sections of the retina and choroid from the region of the yellow spot. The stellate pigment of the choroid has a deep-brown colour; the chorio-capillaris equals in thickness the remainder of the choroid, and no pigment is seen in it; the choroidal epithelium is much disturbed, and clusters of its granules are pushed into the retina. The retina appears compressed. No rods are seen; but the fibres of the framework, the granules, and the optic nerve-fibres can be recognized; the former are much bent and distorted.

Slides 30–33. Parallel sections of the retina and choroid, one-fifth of an inch from the lower retinal aperture; many of the sections are carried through a black patch in the

choroid. The stellate pigment of the choroid has a light-brown colour. The chorio-capillaris equals in thickness the remainder of the choroid; no pigment is seen among it. The choroidal epithelium is arranged in clusters of pigment-granules, many of which are pushed into the retina. The regular arrangement of the retinal elements is destroyed: no rods can be recognized. The fibres of the framework, the granules, and the optic nerve-fibres are perceptible: the former are much bent and compressed.

Slides 34-40. Parallel and oblique sections of the retina from the upper region of the yellow spot. Clusters of black pigment-granules (choroidal epithelium) are pushed into the retina; no rods are perceptible; the granules, the optic nerve-fibres, and the fibres of the framework can be seen. The retina has only one-fifth of its normal thickness; the fibres, in a few places, are distorted and torn asunder, forming lacunæ, and making the retina appear thicker than at other places.

Slides 41-46. Transverse sections of the retina and choroid, one-fifth of an inch from the retinal aperture. The inner surface of the retina has a ragged appearance, which is due to portions of the optic nerve-fibres having fallen out. The retinal elements near the optic nerve-fibres are well seen; no granules or rods are perceptible; the fibres of the framework appear very much compressed.

Slides 47 & 48. Portions of choroid and retina, showing the stellate pigment, which has a deep-brown colour, and the disturbed choroidal epithelium; large clusters of black pigment-granules may be noticed in the substance of the retina.

Slides 49-59. Transverse sections of the retina and choroid, about one-fifth of an inch from the inner retinal aperture, showing the adhesions of clusters of choroidal epithelium to the outer surface of the retina. No rods can be recognized. The granules and the corresponding fibres of the framework are missing in many places; in other places the optic nerve-fibres, the adjoining retina, the framework, and a peculiar layer of fibres, which runs parallel with the choroid, may be recognized.

Slides 60-62. Parallel sections of the retina and choroid, one-tenth of an inch from the lower retinal aperture. The thickness of the retina is from one-third to one-fifth less than in health. The rods, the granules, and the fibres of the framework cannot be recognized; the optic nerve-fibres and the adjoining retinal elements are perceptible.

Slides 63-65. Slightly oblique sections of the optic nerve, where it crosses from the scleral to the choroidal aperture; the connective tissue, bundles of optic nerve-fibres, and in some places the individual fibres, can be recognized.

65. A posterior lateral portion of the tunics of a right eye, the section being carried through the middle of the optic nerve, parallel with its nerve-fibres. The sclerotic and the deep-brown choroid are in apposition. The retina is greyish-white and opaque, and in great part detached from the choroid. In the area of the retinal aperture the optic nerve is considerably cupped.

66. An anterior lateral portion of the same eye, comprising part of the sclerotic,

choroid, retina, iris, and ciliary processes, with one-half of the greyish translucent crystalline lens ; the latter and the iris are in apposition with a fleshy nodular substance, which occupies the place of the cornea. The margin of the lens appears in immediate contact with the ciliary processes. The tunics are in apposition.

67. The corresponding portion of the other side of the same eye, preserved in pyroxylic spirit and water. The tunics and the lens have become opaque and swollen. The retina is thrown into folds ; its termination along the ora serrata is well seen.

G. P., aged 25 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy man, of fair complexion, had the right eye struck, ten years ago, by a piece of tobacco-pipe. The eye was much inflamed for two months ; after three months he was able to read ordinary type for any length of time with it, but not to recognize distant objects. Occasional sudden loss of sight, and pain, sometimes slight photophobia and lachrymation, were noticed until two years ago ; the patient then went to Australia, where, after one year, vision became more misty ; objects appeared in a fog ; at the same time the pain, lachrymation, and photophobia became more troublesome. Five months ago he presented himself at the hospital with chronic iritis, closed pupil, and mere perception of light with this eye. Iridectomy produced a temporary relief ; but the above-mentioned inflammatory symptoms reappeared a week afterwards. The left eye has felt weak for the last two years, and there has been much lachrymation and occasional mistiness of sight for six months. The right eye was excised, July 17th, 1861.

Microscopic sections prepared from this eye.—Slides 1–8. Parallel sections of an equatorial portion of the retina, showing the rods and bulbs, the fibres of the framework, the outer and inner limitans, the normal layers of the retina, and the fibres of the optic nerve.

Slides 9 & 10. Portions of choroidal epithelium.

Slides 11 & 12. Portions of choroid deprived of their epithelium, showing the stellate pigment and the vasa vorticosa.

68. The lateral half of the tunics of a right eye, the section being carried through the middle of the optic nerve and parallel with its nerve-fibres. The greater part of the lens has been removed. The deep-brown choroid, with its vasa vorticosa, is well seen through the greyish, strongly translucent retina ; the latter is, in some places, thrown into delicate folds. The scleral, choroidal, and retinal apertures, with the optic nerve passing through, are well marked.

J. B., aged 57 (under the care of Mr. Hulke, Royal London Ophthalmic Hospital), a healthy farm-labourer, of dark complexion, scratched the right eye with a piece of straw

several years ago. The accident was followed by an inflammation of three weeks' duration, resulting in an opacity of the cornea. The patient could see to count fingers with difficulty. A similar accident happened two weeks ago, causing severe pain and ophthalmia, with a perforating ulcer of the cornea and complete loss of vision. During the last four days the left eye has begun to sympathize. The right eye was excised, February 26th, 1861.

Dissection.—Tension diminished. Cornea translucent, ulcerating in its centre. Retina transparent, appearing unusually thick; the region of the yellow spot was golden yellow, surrounded by a greyish translucent halo; the retina was here thrown into delicate folds, which radiated from the centre of the yellow portion. The optic nerve formed a papilla projecting much beyond the retinal aperture.

69. An anterior lateral portion of the tunics of a right eye; the sclerotic and the brown choroid are in apposition. The retina, portions of which are thrown into delicate folds, is strongly translucent. A grey and opaque inflammatory deposit may be seen along the ora serrata and upon some of the ciliary processes; and corresponding to this, in the adjoining cornea, an appearance as if part of the corneal margin had been separated from the remainder by some injury. This part is now seen projecting into the anterior chamber. The lens has been removed.

70. The opposite portion of the same eye.

G. K., aged 25 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy man, of fair complexion, had the right eye injured by a piece of a percussion-cap seven years ago; vision remained misty only for one day, but the patient fancied that the piece remained in the eye. Three months later he had a severe attack of diarrhœa, followed by an inflammation of the right eye for six weeks, attended with pain, œdema of the eyelids, inability to open the lids, &c.; after recovery from this he was able to read the smallest type, but not so well as with the left eye; he was troubled with museæ, and with occasional double vision; gradually vision of the right eye became misty, and, two years ago, it was reduced to mere perception of shadows; at that time flashes, fiery waves, &c., were noticed in this eye. Eighteen months ago, during an attack of ague, inflammation of the eye again ensued, with complete loss of vision; the fiery waves and flashes reappeared occasionally, especially when moving the eye quickly; lately the attacks of inflammation became more frequent, and were accompanied by supraorbital and maxillary pain. Work had to be discontinued with the left eye whenever the right was inflamed, because it felt weak, and especially because the inflammation in the right appeared to increase.

The right eye was excised, April 12th, 1861.

Dissection.—Tension diminished. Eye small, slightly squared. Optic nerve normal. Cornea: upper two-thirds transparent, lower third occupied by opaque tissue; anterior chamber of moderate size. Iris of a slate-colour; pupil irregular, small, closed by opaque

tissue. Lens small, chalky. One-third of the vitreous space occupied by vitreous substance, the remainder by transparent fluid. Tunics in apposition. Retina transparent. In the choroid, the vasa vorticosæ and the insular arrangement of the stellate pigment were well marked.

71. A lateral posterior portion of the sclerotic and choroid of an enlarged left eye, together with part of the optic nerve, the section being carried somewhat obliquely through the latter. A large portion of the brown so-called choroidal epithelium has been removed, to show the different appearance of the choroid proper when with and without its epithelium. The empty vasa vorticosæ can be seen.

M. M., aged 42 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a rather delicate-looking woman (had been stout before her marriage), has had two children and seven miscarriages. The two children died: after several confinements, she suffered from "inflammation of the uterus;" otherwise she never was ill. She states that for the last thirty years she has been shortsighted; that she could do fine work well, but not recognize distant objects. The eyelids have suffered from tinea for the last nine years. The right eye felt weak for the last two years; since then the patient has been unable to do needlework, &c., at night. Three years ago the left eye was struck by a fist; continued lachrymation followed, and a black speck, "like a small spider," appeared to float close before or within the eye; it remained of the same size until vision was gone. Vision, soon after the blow, became misty. A thick veil appeared to intervene between the eye and external objects: this veil gradually became thicker. The eye, within three months, had lost all perception of light; it was neither painful nor unusually bloodshot; no flashes, stars, &c., were noticed. After the eye had been blind for two years, it became inflamed and painful, and seemed to grow larger; it appeared to weaken the already impaired right eye considerably. The left eye was excised, April 12th, 1860.

Dissection.—The surface of the cornea slightly uneven and nebulous. Iris: only a narrow strip was perceptible; the area of the pupil was in greater part occupied by the lens, which was changed into a yellow and opaque substance, and somewhat displaced, its inner margin being displaced outwards and backwards. Vitreous: absent in the retinal area; in the ora area filmy, slightly opaque, appears to have led to displacement of the lens. Retina detached from the choroid, funnel-shaped, yellowish, strongly translucent. Sclerotic and choroid in apposition, much thinned in the region of the yellow spot, and staphylomatous. Choroidal pigment almost wanting at the thinnest portions, of a brown colour and abundant elsewhere; inner surface of the choroid sprinkled with black dots and patches (changed choroidal epithelium). Dirty brown, very thick fluid occupied the space between the choroid and retina.

72. The anterior half of a right eye, showing an amber-coloured opaque lens, of

which the anterior and portions of the posterior surface are calcified. The sclerotic and the deep-brown choroid are in apposition; numerous atrophic patches are observed in the latter, near the ora serrata, together with grey translucent shreds of the displaced retina. Posterior synechia and atrophy of the iris may also be observed.

J. C., aged 54 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy woman, of fair complexion, had her right eye injured, fifteen years ago, by some hot fat touching it; an inflammation of two months' and impairment of vision followed; five years after this, occasional attacks of dimness, and a yellow mist round the flame of a candle, with rainbow-colours in it, were observed; vision gradually got worse, and was entirely lost five years ago. Attacks of pain in the eye have been frequent lately. The right eye was excised, May 4th, 1861.

Dissection.—Optic nerve normal. Cornea transparent; a few posterior synechiae of the iris. Lens changed into a chalky substance; a large rent in the suspensory ligament admitted of communication of the fluid in the posterior part of the eye with that in the anterior chamber. Choroid: retinal portion healthy; ciliary portion containing many atrophic patches. Retina funnel-shaped, detached, thrown into delicate and almost transparent folds, some of which are sprinkled with blood-spots. Vitreous reduced to one-third its usual bulk; that which remained appeared healthy. The space between the choroid and retina occupied by thin transparent fluid.

Microscopic sections prepared from this eye.—Slides 1 & 2. Transverse sections of the retina. The place of the rods is occupied by a dirty-grey and opaque granular substance. The distorted fibres of the framework, forming lacunae, and the outer and inner limitans are well seen. The optic nerve-fibres are atrophied. A rent may be seen in the substance of the retina, the granular layer having been drawn away from the remainder of the membrane.

73. The anterior portion of a right eye, comprising the cornea, the ciliary region, with some choroid and retina. The tunics are in apposition; the retina is grey-white and opaque, and sprinkled with minute black patches of choroidal epithelium. A circumscribed portion of the tunics of the ciliary region is thinned, atrophic, and staphylomatous. A portion of the black uveal surface of the iris, surrounded by the grey apices of the ciliary processes, may be seen, and adjoining it a white opaque substance, which is a cicatrix occupying the place of part of the cornea. The free margin of the iris, together with an opaque white substance, which appears to have been the lens-capsule, adheres to the cicatrix. Numerous grey translucent delicate membranes and filaments, remnants of the vitreous, can be traced, stretching from the ora serrata and

from the retina to the periphery of the changed lens-capsule. Similar membranes float in the area of the ciliary processes.

74. Two portions of the optic nerve, with a small portion of the adjoining tunics, from the same eye, hardened in chromic acid, previous to being preserved in naphtha and water. The tunics are in apposition. The section is carried through the middle of the nerve, and parallel with its fibres, to show its cupped condition. The bottom of the excavation is level with the middle of the scleral aperture, and steeper on the side towards the yellow spot, the retina appearing to have suffered much less by the intraocular pressure at the opposite margin.

H. H. C., aged 38 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a hair-dresser, generally in good health. Thirty years ago he had the right eye wounded by an arrow; vision was lost at once. Fourteen months ago the eye began to enlarge, and to suffer from slight attacks of pain and redness. In November 1860 there was severe pain, with much ophthalmia, followed by a considerable enlargement of the eye. The patient noticed with the left eye a mist, with a circle of rainbow-colours in it, round the flame of a candle whenever the right eye was inflamed. Lachrymation, photophobia, inability to fix objects, and impairment of sight have also been observed in this eye lately. The right eye was excised, January 18th, 1861.

Dissection.—The tunics of the ciliary region in front of the superior rectus were thinned and staphylomatous. Cornea: upper two-thirds strongly translucent; lower third occupied by a yellowish opaque deposit, surmounted by grey and opaque tissue. Anterior chamber small. Iris adherent to the yellow deposit in the cornea. Pupil closed. The other morbid appearances are noticed in the account of the preparation.

Microscopic sections prepared from this eye.—Slides 1–4. Transverse sections of the choroid, and parallel sections of the retina, from the region of the yellow spot. The arteries and the vasa vorticosa of the choroid are filled with blood, the stellate pigment scanty, the chorio-capillaris empty, the elastic lamina well seen, the choroidal epithelium changed into clusters of black pigment-granules, some of which project into the retina. The thickness of the retina is reduced in many places; no rods are perceptible; the adjoining granular layer is also destroyed in many places. The fibres of the framework, the inner granular layer, and the optic nerve-fibres are well seen.

Slides 5–7. Parallel sections of the retina and choroid. In the choroid, the pale-brown stellate pigment and the vasa vorticosa can be seen. The choroidal epithelium appears nowhere healthy; in many places it has entirely disappeared, in others it is thrown together in heaps of pigment-granules. In the retina the bundles of optic nerve-fibres can be seen upon its inner surface; its outer surface is sprinkled with minute brown patches of choroidal epithelium.

Slides 8 & 9. Parallel sections of the retina and choroid from the equatorial region. The

stellate pigment of the choroid is brown ; the chorio-capillaris equals in thickness the remainder of the choroid ; the inner surface of the choroid is sprinkled with pigment-granules. The retina is much reduced in thickness ; the rods and the adjoining retinal elements have disappeared : a few granules, some of the torn, disturbed fibres of the framework, and the well-preserved fibres of the optic nerve are seen.

Slides 10-14. Portions of choroid, and parallel sections of the retina, from a staphylomatous part of the eye. The stellate pigment of the choroid has a light-brown colour ; the chorio-capillaris equals in thickness the remainder of the choroid. Numerous portions of the choroid are infiltrated with a yellowish amorphous substance, portions of which project towards the retina. The thickness of the retina is normal in some, and much reduced in other parts : no rods can be recognized, and the adjoining granules and framework are destroyed ; in many places the optic nerve-fibres can be recognized ; the fibres of the framework are distorted.

75. The posterior half of the tunics of a right eye, with the optic nerve. The sclerotic and the brown choroid are in apposition. The retina is slightly greyish, and almost transparent ; it has become a little detached from the choroid along the line of section. The insular arrangement of the choroidal pigment and the vasa vorticosa are well seen. The small, well-defined, slightly oval, and pinkish-red dot is the optic nerve.

76. The anterior half of the tunics of the same eye, from which the lens and cornea have been removed. Viewed from within, the ciliary processes and the lens-capsule (dotted over with uveal pigment) are seen extending across the ciliary area, and dragging many of the ciliary processes inwards ; from without may be observed the absence of a large portion of the fibrous part of the iris, in consequence of the operation of iridectomy, the corresponding uvea remaining adherent to the lens-capsule. The incision through the tunics of the eye, part of the iris and lens-capsule, was made after removal of the eye.

H. P., a boy, aged 12 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), had some lime thrown into the right eye, three months ago ; it was inflamed for a month, and vision was reduced to faint perceptions of light. Left eye normal. The right eye was excised, July 17th, 1861.

Dissection.—Tension diminished. The eye slightly squared by the resistance offered by the recti muscles. The place of the cornea occupied by a fleshy opaque substance. Tunics in apposition with each other. Vitreous healthy. Retina transparent. The choroid had an unequal brown colour.

77. The anterior portion of a left eye divided into lateral halves, together with two small equatorial portions of the tunics of the same eye. In one of the anterior halves the corresponding portion of the grey translucent crystalline lens may be seen *in situ*. The place of the cornea is occupied by opaque staphylomatous tissue, the posterior surface of which is coated with the pigment of the iris. The retina, choroid, and sclerotic are in apposition with each other. The retina is slightly greyish, strongly translucent, and has along the line of section become somewhat detached from the choroid; it is entirely removed from one of the equatorial portions to show the contrast of the colour of the brown choroid, with and without retina. The pigment of the ciliary processes has in many places, especially at and near the ora serrata, either entirely or in greater part disappeared; the choroid in these places appears sprinkled with white-brown and with minute black dots, the result of former inflammation.

S. P., aged 45 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy woman, of dark complexion, had the left eye injured a year ago by a piece of coal striking it; severe inflammation, chemosis, and œdema with ulceration, and sloughing of the greater part of the cornea followed, with much pain in the eye and the supraorbital region. The eye was excised, July 30th, 1861.

Dissection.—Tension normal. Shape slightly squared. Optic nerve: partly grey, partly yellowish white and opaque. The place of the cornea occupied by a thick, white, and opaque staphylomatous tissue, to which the iris is adherent. (For the remaining morbid appearances, see the description of the preparation.)

78. An anterior portion of a right eye, showing atrophy and thinning, with a staphylomatous condition of the tunics of the ciliary region, and of some of the adjoining portions of the choroid and retina. The well-defined, round pigmentless spots seen near the ora serrata are transparent portions of choroid viewed through the retina. The irregular distributions of pigment in the ciliary choroid, due to expansion of this portion, together with a partial or entire destruction of the ciliary processes, are well seen. Some stripes of the dark-brown uveal surface of the iris, which in most places is torn away from its ciliary attachment, may be seen through the greyish translucent lens. The retina, in apposition with the choroid, has almost retained its transparency.

M. P., aged 30 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a

healthy woman, of dark complexion, ran a pin into the right eye nineteen years ago. Within fourteen days vision was reduced to perception of light, and "on the application of some eye-lotion" was lost altogether. The eye remained very painful, and "saw purple lights," for two or three days after the loss of vision. Eleven years ago it was severely struck by a piece of cork; for three months much swelling and inflammation followed; the left eye felt weak during this time. Since the first injury the eye appeared a little enlarged, more so after the second; and after childbirth it has always been painful, especially after the second injury, the pain extending from the eye over other branches of the fifth nerve. Want of rest, hard work, &c., brought on pain. The right eye was excised, April 25th, 1861.

Dissection.—Shape: general lateral enlargement of the eye, especially between the outer and upper rectus. The peripheral portions of the cornea translucent; the centre occupied by a staphylomatous leucoma. Lens containing chalky deposits among its transparent substance. Optic nerve deeply excavated. Retinal area of the vitreous space occupied by viscid transparent fluid. Ciliary area containing healthy vitreous. Numerous portions of the choroid, especially the staphylomatous ones, were atrophic.

Microscopic sections from this eye.—Slides 1–3. Sections of the excavated optic nerve from the sclero-choroidal aperture. The excavation extends beneath the level of the inner scleral aperture; its walls are lined by debris of the optic nerve and by blood-vessels. The margins of the sclero-choroidal aperture project considerably. In slide 3, the connective tissue, the blood-vessels, and the normal bundles of optic nerve-fibres are perceptible.

Slides 4–6. Oblique sections of the retina, about one-tenth of an inch from the retinal aperture. The rods and all the retinal elements are perceptible; only one granular layer can be seen.

Slide 7. A portion of choroid, one-tenth of an inch from the choroidal aperture. The choroid proper presents a dirty-grey opaque appearance; some of the stellate pigment is perceptible.

79. The anterior half of the tunics of a staphylomatous right eye, together with the almost transparent crystalline lens. The suspensory ligament of the lens is much elongated, and the atrophic ciliary processes are far distant from its margin. The tunics are in apposition. The pigment of the choroid, especially in the ciliary region, is highly atrophied. The place of the cornea is occupied by newly formed and staphylomatous tissue. The pigment of the iris is spread out upon the inner surface of the staphyloma. The ciliary region of the tunics, as well as the iris, participate in the staphylomatous changes.

From a man, 40 years of age (under the care of Mr. Dixon, Royal London Ophthalmic Hospital). The eye was excised, May 24th, 1860.

Dissection.—Shape and size: normal behind the insertion of the recti, but highly staphylomatous, with thinning of the tunics, in the ciliary region. Cornea strongly translucent;

iris in apposition with it. Retina transparent; all its elements can be recognized. Optic nerve deeply excavated, but the optic nerve-fibres can be traced along the walls of the excavation.

80. The lateral half of a left eye, the section being carried somewhat obliquely through the middle of the optic nerve. Many portions of the brown choroid are detached from the sclerotic, and the entire slightly brownish-grey and opaque retina is detached from the choroid and thrown into folds; the holes in it are artificial; part of its anterior portion is dragged into an opening at the junction of sclerotic and cornea, which opening is filled with lymph. The adjoining portion of cornea is swollen, and bends downwards and outwards. The spaces between the detached tunics were occupied by blood. No vitreous was found.

81. The other half of the same eye, preserved in glycerine. The retina, except a few shreds along the ora serrata, has been removed. The almost complete detachment of the deep-brown choroid from the sclerotic is well seen.

M. L., aged 70 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a sailor, a very healthy strong man, of fair complexion, noticed six years ago a little black spot moving about before the left eye; afterwards several such spots appeared. Some time later he found that vision of this eye was reduced to perception of light. In September 1861, a cataract was removed from the eye by extraction; the section had healed, and the pupil was central and clear five days after the operation. On the eighth day he knocked the eye against another man's shoulder; the corneal section was ruptured, and the contents of the vitreous space escaped. The eye was now intensely painful, but only for two or three hours. The moment the eye was struck, a flash of light "like a shell bursting" and streaks of bright yellow light were noticed for an instant; it remained dark for four days, when a small bright star appeared in it, which followed the movements of the organ. Sometimes the star appeared as large as a finger-nail; its periphery always bright; its centre sometimes dark, or brown, or red, or black. Soon after this, four or five similar stars appeared; they were no longer perceived after excision. The left eye was excised, October 2nd, 1861.

Dissection.—The upper half of the cornea, swollen, yellow, and opaque, was detached from its scleral attachment, and bending downwards and outwards obscured the lower half, which retained its translucency; the gap was filled out by lymph deposited in and upon the upper half of the iris. The crystalline lens and vitreous were missing.

82. The posterior half of the tunics of a left eye, with the optic nerve. The tunics are in apposition. The choroid has a deep-brown colour; its pigment

is not clearly seen through the greyish translucent retina, which in several places is raised into folds. The optic nerve, at its passage through the tunics, appears round, well defined, and pinkish white. A yellowish-brown dot, surrounded by a greyish opaque halo, marks the situation of the yellow spot.

E. H., aged 30 (under the care of Mr. Wordsworth, Royal London Ophthalmic Hospital), a healthy man, of fair complexion and red hair, suffered eighteen months ago from gonorrhœa; and three months later from granular eyelids, with purulent discharge; five months ago he ran a piece of straw into the left eye, which was followed by redness, photophobia, lachrymation, and a great deal of pain in the eye and corresponding temple, with impairment of vision. During the last three weeks the pain and redness have subsided, but the eye is becoming larger; it has lost all perception of light. Photophobia, lachrymation, and inability to fix objects have affected the right eye since the injury to the left. The chronic purulent discharge from the granular lids has continued. The left eye was excised, November 30th, 1861.

Dissection.—Size and shape normal. The place of the cornea occupied by staphylomatous tissue. *Lens in situ.* Tunics and vitreous healthy.

83. The lower half of a left eye. The sclerotic and the deep-brown choroid were in apposition. The retina is funnel-shaped; detached from the choroid; greyish brown and opaque; numerous delicate flakes of vitreous, of a similar colour, are enclosed within it. The grey and opaque apices of the ciliary processes, the atrophic iris, and a pigmented cicatrix at the margin of the cornea may be observed.

84. The upper half of the same eye, preserved in glycerine. The tunics are in apposition, except the retina, which, while it has retained its original appearance, has become slightly detached from the choroid along the line of section. Numerous effusions of blood are seen in the brown choroid behind the ora serrata.

J. L., aged 60 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy man, of fair complexion, struck the left eye, a fortnight ago, with a bar of iron; this was followed by much pain in the eye and over the corresponding side of the head, by redness also, and by a complete loss of sight. A sudden flash of light, "like lightning," was observed at the time of injury, and the flash returned whenever the eye was moved about during the next twenty-four hours. A dimness of sight was noticed in the right eye immediately after the injury: it is decreasing lately. The patient has been using convex glasses for the last seven years. The left eye was excised, October 22nd, 1861.

Dissection.—Cornea transparent. Anterior chamber full of blood. A rent runs across the tunics close to the upper and inner margin of the cornea, and a second smaller one parallel to it, and nearer the insertion of the rectus; black pigment fills the area of the rent. Iris and crystalline lens missing. Tunics in apposition with each other. The choroid has a mottled brown colour; a few diffused red patches are seen in its substance. Retina transparent; one of its blood-vessels near the retinal aperture having given way, a considerable blood-spot is observed along its walls. Vitreous space occupied by normal vitreous and by transparent yellowish fluid.

85. The upper half of a right eye, the section being carried somewhat obliquely through the middle of the optic nerve. The delicately folded dirty-grey-brown and opaque membrane is the choroid; it is in greater part detached from the sclerotic; upon it, near as well as in the ciliary region, may be seen some delicate transparent membranous shreds, the atrophic and detached retina, and a yellowish-grey and opaque substance—the vitreous humour. The iris is highly atrophied. The lens has been removed.

86. The other half of the same eye. The choroid (the apices of the ciliary processes excepted), the retina, and the vitreous humour have been removed to show the clots of blood and fibrin, which adhere to the inner surface of the sclerotic, the result of hæmorrhage from the choroid.

E. B., aged 75 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a woman whose health has generally been good, states that thirty years ago the right eye became inflamed spontaneously; some lotion was applied, which caused intense pain with swelling. On opening the eye the next day, she was blind, even the perception of light no longer existing. The inflammation subsided after six weeks. Afterwards she had three more very painful attacks of inflammation. Four weeks ago this blind eye was struck against a fender, the injury being followed by intense pain in the eye and over the corresponding side of the head.

The left eye was slightly inflamed during the attacks in the right eye; but vision continued good until eighteen years ago, when the patient observed that she could not see distant objects or small type, everything appearing as if seen through a fog; this fog increased steadily, and after three years the eye had lost all perception of light. Blue, red, and white flashes were noticed in the eye occasionally during the progress of impairment of sight, but not since the eye has become blind. The right eye was excised, April 17th, 1861.

Dissection.—Shape: the tunics of the eye are considerably staphylomatous between the insertion of the oblique muscles, though the sclerotic is not changed in colour. Cornea: upper half transparent; lower half occupied by chalky deposits and by opaque tissue. Retina translucent, displaced from the choroid, and loosely floating in the surrounding blood.

Choroid: greater part *in situ*, thickly sprinkled with chalk-granules, highly atrophic; at the staphylomatous portion the choroid is separated from the sclerotic by effused blood.

Microscopic section prepared from this eye.—Slide 1. Portions of choroid from near the optic nerve. The stellate pigment is dirty brown and abundant; the choroidal epithelium is changed into clusters of pigment-granules.

87. The posterior half and the two lateral portions of the anterior half of a left eye. The lens, the vitreous humour, and part of the retina had escaped through an ulcer in the cornea during excision of the eye. The change of colour and position of the remaining tunics is due to the intraocular hæmorrhage which ensued during the operation. The brown choroid in the three portions is detached from the sclerotic. There is a thick deposit of fibrin on its outer surface. A portion of brownish-grey, opaque, and folded retina may be seen in the posterior half, surrounded by choroid.

J. D., aged 52 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy man, of fair complexion and red hair, got some coal-dust into the left eye four weeks ago; this was followed by inflammation of the eye, which increased under continued exposure to smoke and wind. There was much redness, an extensive ulceration of the cornea, photophobia, lachrymation, pain in the eye and over the corresponding side of the head, which increased when the ciliary region was touched. Vision was reduced to the faintest perception of light. During the last four days the right eye has been suffering from ciliary congestion, photophobia, inability to fix objects, and slight pain. The left eye was excised, November 3rd, 1861.

88. The inferior half of a right eye, of normal size, but of irregular shape. The section is carried through the optic nerve and parallel with its nerve-fibres. The choroid is in many places detached from the sclerotic, and the greyish-white and opaque retina is entirely detached from the choroid; the brown colour of the latter is in some places obscured by deposits of fibrin. Blood and fibrin occupied the space between the detached tunics of the eye. Half of the greyish-yellow and opaque lens is *in situ*.

89. The other half of the same eye. The portion of the lens has been removed. The detachment of the choroid is more considerable. There is a rupture of the cornea and adjoining sclerotic.

J. L., aged 32 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a traveller, a healthy man, of fair complexion, received a blow upon the right eye a week

ago, which was accompanied by instantaneous loss of vision, and followed by severe pain in the eye and over the corresponding side of the head. The right eye was excised, September 9th, 1861.

90. An antero-lateral portion of the tunics of a right eye, the section being carried through the cornea near its middle. The sclerotic, the deep-brown choroid, and the retina were in apposition; the latter has become greyish white, opaque, and detached from the choroid. The brownish-grey substance within the retina consists of blood-clots entangled in vitreous substance. No lens was found. A portion of the iris was missing, and, corresponding to this part, a cicatrix may be seen in the ciliary region of the sclerotic. The anterior chamber is large; and the inner surface of the cornea appears wrinkled.

91. The other half of the same eye.

G. A., aged 38 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), had the right eye struck, four weeks ago, by the horn of a bull. A flash of light was perceived at the time. Vision was lost at once, and the eye and the corresponding side of the head became painful. A week later the anterior chamber, which was filled with blood, was punctured, and a bandage and slight pressure applied; the pain, however, soon returned. Photophobia and inability to fix objects came on in the other eye at the time of injury, and has continued to increase. The right eye was excised, April 27th, 1861.

Dissection.—A line of pigment along the upper margin of the cornea indicated the seat of a former rupture in this part of the tunics of the eye. The central portion of the cornea was opaque; peripheral portion transparent. Anterior chamber full of blood. Iris torn away from its ciliary insertion.

Microscopic sections prepared from this eye.—Slide 1. A portion of choroid from the region of the yellow spot. The vasa vorticosa are tortuous; the choroidal (stellate) pigment has a deep-brown colour.

Slides 2–5. Sections of retina from the region of the yellow spot. There was in this part an elevation of the retina towards the vitreous space. The rods, the oblique undulating course of the fibres of the framework (peculiar to this part), then the remainder of the framework, the outer and inner granular layer, and the remaining retinal elements can be recognized.

Slide 6. Parallel sections of the optic nerve from the scleral, choroidal, and retinal aperture, showing the bundles of optic nerve-fibres. The blood-vessels and the connective tissue are well seen; the choroidal aperture is particularly well marked.

92. The lateral portion of a somewhat shrunken and irregularly shaped right eye.

One of the suspending threads is fixed to the middle of the cornea; the other is passed through the dirty-brown choroid, and through the sclerotic. The optic nerve, with part of the adjoining tunics, has been removed. The posterior portion of the interior of the eye is occupied by a brownish-red substance, consisting of blood and fibrin, and the ciliary portion by yellowish-grey and opaque lymph and pus. The tunics surrounding the latter are much thickened by inflammatory products, and displaced from each other. A cicatrix may be observed in the equatorial portion of the sclerotic. The yellow, opaque, and distended lens-capsule enclosing débris of lens, and adhering to the surrounding parts, may also be seen. No retina was found. The posterior portions of sclerotic and choroid are in apposition.

93. The other portion of the same eye. The suspending threads are fixed near the cicatrix in the sclerotic.

E. A., aged 40 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a thin woman, of fair complexion, suffering from aene rosacea, had the right eye struck by a pebble seven weeks ago. Flashes of light were noticed in the eye for a few minutes after the injury. Vision at once became misty, but patient was able to recognize people for three weeks; she then observed, when looking down, a black cloud before the eye, and an increase of the mist, which advanced from the temporal towards the nasal side of the eye; some irritating eye-lotion was now applied, and vision was found to be gone the following day. The pain in the eye and over the corresponding side of the head and neck was severe. Several incisions were made, which allowed some pus to escape from the interior of the eye. The left eye suffers from increasing photophobia, lachrymation, and pain. The right eye was excised, July 13th, 1861.

Microscopic sections prepared from this eye.—Slides 1 & 2. Sections of a clot of blood in the retina, near the optic nerve, and beneath the optic nerve-fibres.

Slide 3. A slightly oblique section of the optic nerve from the scleral choroidal aperture, showing the connective tissue, which forms large lacunæ, as if many of the optic nerve-fibres had become atrophied. Amorphous grey granular matter is scattered among the bundles of optic nerve-fibres.

94. The lateral half of a right eye, the section being carried through the optic nerve near the middle, and nearly parallel with its nerve-fibres. The grey-brown substance which occupies the greater portion of the vitreous space, as well as circumscribed parts between the sclerotic and choroid, consists of fibrin and blood-corpuscles. The optic nerve and retina appear brown and

opaque; the latter is detached from the choroid, and may be traced from the optic nerve to where it disappears behind the grey-brown substance. The choroid has a deep-brown colour; it is in most places slightly detached from the sclerotic by clots similar to the one in the vitreous space. A large rent is observed across the cornea, near its margin. No lens was found.

95. The other half of the same eye. The adhesion of the anterior surface of the iris, the margins of the rent in the cornea, and the change of colour in the optic nerve may be observed.

E. W., aged 23 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy woman, of dark complexion, received a blow on the right eye twelve days ago. Vision was lost at once; much blood escaped from the eye. The fellow eye began to sympathize at once, as evinced by photophobia, inability to fix the eye on objects, and pain on touching the ciliary region. The right eye was excised, June 22nd, 1861.

Dissection.—Shape and size normal. Cornea transparent; a rupture extended through the tunics of the ciliary region, at its lowest margin.

96. The lateral half of a considerably shrunken left eye, the section being carried through the optic nerve, and parallel with its nerve-fibres. The thickened sclerotic is in apposition with the dirty-brown choroid; it is drawn inwards in its superior and inferior equatorial regions. The place of the vitreous and retina is occupied by dense white fibrous tissue.

97. The other half of the same eye.

J. S., aged 57 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy man, of fair complexion, five months ago had a cataract removed from the left eye by Shuft's method (iridectomy and extraction of the cataract with a large scoop). Much straining and coughing followed, the night after the operation; the eye finally suppurated. The sympathy of the other eye, and the great pain in the shrinking, made excision necessary. The left eye was excised, October 12th, 1861.

98. A lateral portion of a considerably shrunken and irregularly shaped left eye, the section being carried through the middle of the cornea. No retina, vitreous, or lens was found. The posterior part of the sclerotic is much thickened; within it a part of the choroid may be seen.

M. L. L., aged 17 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a

healthy girl, of fair complexion, had the left eye injured, seven years ago, by a brass pin. A flash of light was noticed, and vision was lost at once. The eye immediately became smaller, and has continued shrinking since ; it was occasionally red, but never painful. The right eye frequently becomes bloodshot, but does not inconvenience the patient otherwise. The left eye was excised, April 2nd, 1861.

Dissection.—The eye was much shrunken, but of good shape. Cornea translucent. Lens and vitreous missing. Sclerotic much thickened posteriorly. Choroid of a dirty-brown colour. Retina grey and opaque.

99. The inferior half of a shrunken left eye, the section being carried through the middle of the optic nerve, and parallel with its nerve-fibres. The sclerotic is much and irregularly thickened in its posterior portion. The tunics are thickened, rendered indistinct and matted together by pus and lymph, which also occupy what remains of the vitreous space, and surround a small blackish foreign body (a piece of metal). No lens was found.

100. The other half of the same eye. There is an increase of the curve of the cornea, caused by the drawing in of its margin towards the shrinking inflammatory products in the interior of the eye.

J. F. J., aged 22 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital). a ~~carman~~ ^{carman}, of fair complexion and general good health, had the left eye injured by a piece of steel a month ago, but was doubtful whether it remained in the interior of the eye ; it appeared to him “ as if the eye was full of light, with many little black holes in it.” Inflammation, with pain in the corresponding temple, commenced at once. On the fifth day he was hardly able to open the eyelids, which were swollen and red. There was considerable chemosis ; the cornea was clear ; the area of the pupil turbid. The chemosis decreased after the fifth day. There was hardly any pain in the eye, but much in the left temporal and supraorbital region, which was relieved by poultices. The right eye at once began to sympathize (lachrymation, inability to fix objects, &c.) ; these symptoms have decreased lately, though he is still unable to follow his employment. The left eye was excised, September 17th, 1861.

Dissection.—Vitreous space : a small piece of metal, surrounded by a dense network of capillaries, occupied its lower equatorial region ; the remainder was filled with pus. The sclerotic, choroid, and retina were agglutinated together and infiltrated with pus, so that the separate tunics could scarcely be recognized.

101. The inferior half of a slightly shrunken right eye ; the section is carried through the optic nerve, parallel with its nerve-fibres, but near the margin of the aperture of the tunics of the eye. The sclerotic and choroid are in apposition,

and changed in thickness and colour through inflammation. The yellow opaque substance, which can be traced from the optic nerve into the interior of the eye, is the retina, partly detached from the choroid and infiltrated with inflammatory products. The cornea and lens have been removed ; the opaque lens-capsule is kept expanded.

102. The superior half of the same eye. The cornea remains in one point attached to the sclerotic. The half of the yellow and opaque lens is seen in its capsule, which closes the pupil and is adherent to the iris. The irregular smooth cavity surrounded by the yellow retina was filled with blood and pus. No vitreous was found.

C. E., aged 10 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy girl, of dark complexion, injured the right eye by a fall when two years old. Vision was unimpaired until last Christmas, when, on the eye being struck against a table, total blindness ensued. Lachrymation, redness, and pain in the eye and supraorbital region came on a few hours after the injury, together with lachrymation and photophobia of the left eye. The right eye was excised, September 12th, 1861.

Dissection.—The shape of the eye was irregular, slightly squared. Optic nerve reddish pink in some parts, of normal colour in others. Cornea slightly hazy. Anterior chamber shallow. Pupil closed by a grey and opaque membrane. Lens grey and opaque, its surface sprinkled with deposits of earthy matter in white dots. No retina could be recognized ; a fibrous, opaque-looking substance occupied its place, and filled the vitreous space ; cysts of different sizes, filled with blood and lined with a network of blood-vessels, were seen in this substance.

103. The lateral half of an irregularly shaped and considerably shrunken right eye, the section being carried through the middle of the cornea. The sclerotic is much and irregularly thickened. The brown choroid follows the irregular curve of the sclerotic ; it is drawn inwards by the shrinking, fibrous, white, and opaque contents of the vitreous space, stretching the so-called lamina fusca. A small cyst between the choroid and sclerotic appears to have been the result of this drawing inwards of the choroid. Neither vitreous nor retina was found. The lens has been removed. The lens-capsule is large, opaque, and kept distended by the surrounding morbid products ; the entire uvea is adherent to the anterior surface of the capsule, and, up to the pupillary margin, separated from the iris proper. The anterior chamber is small ; the cornea opaque.

104. The other half of the same eye. Part of the tunics and of the interior of the eye has been removed, together with the optic nerve. The complete separation of the uvea from the iris, and the anterior synechia (adhesion of capsule and pupillary margin to the cornea), are well seen.

J. T., aged 34 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a policeman, rather pale, marked by smallpox, but of good general health, was kicked, seven years ago, upon the right eye, which became much swollen and blind for two weeks, but completely recovered. On the 21st of October 1859 the same eye was struck by a whip; it became very painful at once. Vision in the evening was reduced to perception of light; the following morning the eye was quite blind. No swelling was observed externally, but the anterior chamber was filled with blood. On the 26th there was "traumatic ophthalmia, hypopion, and severe œdema;" and some œdematous conjunctiva was removed. Extreme lachrymation and the aching pain in the eye and forehead continued. The left eye sympathized, as shown by lachrymation, inability to fix objects, &c. The right eye, during the following four months, got smaller, the above-named symptoms continuing, with inability to use the left eye unless the right were closed. The latter was excised, May 14th, 1860.

Dissection.—The eye was much and irregularly shrunken. Cornea small, oval, slightly nebulous. No anterior chamber. Choroid of a brown colour, detached from the sclerotic in several places; this was probably due to the shrinking of the contents of the vitreous space (ora-area): it was œdematous. Transparent fluid occupied the spaces between the detached tunics. Spicules of bony substance were imbedded in the fibrous tissue along the ora serrata. Ciliary muscle œdematous, sprinkled with blood-spots.

105. The lateral half of a considerably shrunken, irregularly-shaped left eye, the section being carried somewhat obliquely through the middle of the optic nerve. The sclerotic and cornea are much thickened; a dark line along the inner surface of the sclerotic, and a similar black substance behind the cornea, indicate the situation of the choroid and of the ciliary processes. The interior of the eye is occupied by a mass of dense white, apparently fibrous, tissue.

106. The other half of the same eye. The sclerotic, near the optic nerve, has a rusty colour, and presents a distinct loss of substance, as if a foreign body had passed through it.

E. B., aged 23 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), had the left eye injured, eight weeks ago, by a chip of iron. A probe was passed through the wound: no foreign substance was felt. Vision was at once reduced to perception of light, and two days later was entirely lost. Swelling of the eyelids, chemosis, and signs of suppu-

ration in the interior of the eye were noticed. Incisions were made into the eye, through which pus escaped: the eye gradually got smaller. The pain was most severe in the corresponding temporal region. Two weeks ago the right eye began to sympathize, with much lachrymation, whenever the eye was used for near objects. The left eye was excised. July 6th, 1861.

107. The lateral half of a shrunken right eye, the section being carried through the optic nerve, and parallel with its nerve-fibres. The shape of the eye, *i. e.* the curve of the sclerotic, is tolerably good. The cornea is opaque; the iris is in apposition with it. The grey-white, opaque, small, and roundish substance seen behind the iris appears to have been the lens; behind it is a considerable quantity of a grey-white and opaque substance (fibrous tissue occupying the space of the vitreous and displaced retina). The choroid can hardly be recognized. A very thick layer of bony substance intervenes between the choroid and the contents of the vitreous space; it extends from the optic nerve to the ora serrata, is thickest in the equatorial region of the eye, and more considerable on one side than on the other; its outer surface is parallel to the curve of the sclerotic.

108. The other half of the same eye. The fibrous substance has been removed from the vitreous space, so that the bony shell may be more clearly seen.

J. S.,^a aged 32 (under the care of Mr. Bowman), writing-master, in good general health, of fair complexion, had the right eye wounded, when twelve years old, by a portion of a gun-cap; this "was extracted immediately after the injury." The eye remained inflamed and painful for six months, during which time it could perceive light; after this it became blind. It appeared smaller after the injury, and was frequently troublesome, especially in windy and dusty weather, and accompanied by headache in the right frontal and orbital region. Three years ago it became inflamed spontaneously; there was no lachrymation, but much redness and pain in the eye. Similar attacks, of from one to four days' duration, occurred frequently for the last eighteen months: since then the left eye began to sympathize; patient could not see to write, &c.; efforts of reading and writing caused severe headache. The right eye was excised, October 30th, 1860.

B.—*Morbid changes of the Eyeball, resulting from disease.*

109. The lateral half of the tunics and of the interior of an irregularly shaped left eye, the section being carried through the optic nerve, and parallel with its

nerve-fibres. The irregularly thickened sclerotic and the brown choroid are in apposition. Within the choroid, and occupying the greater part of the interior of the eye, is a yellow opaque substance, which consists of the retina and the vitreous thickly infiltrated with pus, some of which had escaped through an opening made in the ciliary region of the sclerotic. No lens was found. A black narrow line indicates the situation of the iris and of the ciliary processes, both of which are infiltrated with pus. The anterior chamber is large; the cornea opaque.

110. The other half of the same eye. Some of the choroid and of the purulent contents of the interior of the eye have been removed from near the optic nerve.

A. D., aged 2 (under the care of Mr. Hutchinson, Royal London Ophthalmic Hospital), a pale, fat child, of fair complexion and general good health, without history of syphilis, had lately become cross and restless, and the left eye was observed to present a dull appearance. Soon after the ocular conjunctiva became chemotic, and a deposit of pus was observed, obscuring the outer and upper ciliary region. The eye was excised, October 10th, 1859.

Microscopical sections prepared from this eye.—Slide 1. Parallel sections of a healthy optic nerve from the scleral, choroidal, and retinal apertures, showing the nerve-fibres, the connective tissue, and the blood-vessels.

111. A lateral portion of a left eye, showing a funnel-shaped displacement of the yellowish and opaque retina. The vitreous and the lens were wanting. The opaque cornea, portions of which are thickened (leucomatous), the iris, and the opaque capsule of the lens are in apposition with each other. A thick grey-white and opaque inflammatory deposit hides the ciliary processes from view. The optic nerve, with some of the adjoining tunics, has been removed.

From a boy, seven years of age, whose eye was excised at the Royal London Ophthalmic Hospital, March 8th, 1860.

Dissection.—Shape slightly squared. Cornea: lower half slightly nebulous, upper half occupied by yellow, opaque, and staphylomatous tissue, to which the iris adhered. Retina grey, opaque, thrown into folds, funnel-shaped, detached from the choroid, sprinkled with blood-spots; on its outer surface was a vesicular elevation of the size of a pea, looking like a cysticercus-vesicle. A brown, turbid, viscid fluid occupied the space between the choroid and retina. Sclerotic and choroid in apposition.

112. The inferior half of a right eye. The section is carried through the middle of the optic nerve, and through the crystalline lens. The eye, though smaller

than natural, has nearly retained its normal shape. The sclerotic and the deep-brown choroid are in apposition. The empty vasa vorticosa are well marked. The retina is grey translucent, sprinkled with black pigment-patches, and thrown into numerous delicate folds; it is funnel-shaped and displaced. The pale-yellow, roundish spot in the retina, near the optic nerve, is the macula lutea. The lens is grey translucent; there are some white earthy deposits on its anterior capsule, which is adherent to the iris, and occludes the pupillary area. The anterior chamber is large.

113. The other portion of the same eye. In this the lens has been removed; the calcareous deposits on its anterior capsule are well seen, as also the thickened and opaque state of the hyaloid fossa. There is a peculiar pouch-like expansion of one side of the displaced retina.

L. C., aged 17 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy girl, of dark complexion, regularly menstruating, accidentally found, fifteen months ago, that she could not perceive light with the right eye. Six months ago "a speck" was noticed on the eye, which for some time grew larger, and then remained stationary; two months ago the eye became bloodshot, the redness increasing, but without lachrymation or pain. Lately, the left eye has suffered from photophobia and from occasional attacks of dimness of vision; and a blaze is observed round the flame of a candle. The right eye was excised, November 2nd, 1861.

Dissection.—Tension diminished. Optic nerve healthy. Anterior chamber good. Area of pupil occluded by a grey opaque substance. Space between the choroid and retina occupied by transparent yellowish, very viscid fluid. The other changes are seen in the preparation.

114. A lateral portion of a right eye, comprising part of the sclerotic, cornea, iris, choroid, and retina, showing a detachment of the two latter tunics from each other and from the sclerotic up to the ciliary muscle. The cornea and sclerotic have retained their curve. The choroid, almost black in colour, is sprinkled with dark-grey patches, which are portions of the elastic lamina of the choroid deprived of the choroidal epithelium. A few ciliary nerves, with portions of the lamina fusca, are seen stretching across the space between the sclerotic and the detached choroid. The iris is drawn up to the cornea, and fixed by its pupillary margin to a white and opaque cicatrix in the latter. The retina, of a dark-grey opaque colour, and attached along the ora serrata, floats, together

with some hyaloid membrane, in loose shreds upon the choroid. The delicate, almost transparent, slightly folded and open lens-capsule may be seen behind the iris. The transparent lens has been removed. No vitreous was found. The tunics were surrounded by coagulated blood, the result of hæmorrhage from the outer surface of the choroid.

115. The remainder of the same eye. The choroid and retina are curled up and pushed on one side. The delicate lens-capsule may be seen. In the margin of the cornea, opposite the part of the sclerotic towards which the choroid and retina are displaced, a separation of its continuity, filled with opaque fibrous tissue, may be distinguished, together with an absence of the adjoining part of the iris. This condition is the result of iridectomy.

K. Q., aged 18 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a fair, stout, sallow-looking person, states that her general health is good; but that three years ago, while at school, she caught a cold, which was attended with much fever and with a painful and protracted inflammation of the right eye. Soon after the beginning of the attack red flashes were noticed in the eye, especially at night; these have diminished lately. Vision was lost during the inflammation, though patient thought at times that she had faint perception of light. For the last two years and a half, pain and redness have ceased, but the eye has seemed to "grow larger." There has been photophobia and inability to fix objects in the left eye for the last two or three months. The right eye was excised, May 25th, 1861.

Dissection.—Shape globular. Cornea: central portion opaque, slightly staphylomatous. Anterior chamber small. Iris showing the effect of former iridectomy. Lens transparent, its capsule adherent to the opaque portion of the cornea. Vitreous missing. Choroid in greater part detached from the sclerotic by an effusion of blood forming a dark-red clot. Retina strongly translucent, thrown into folds, sprinkled with yellowish patches and, near the optic nerve, with blood-spots. Optic nerve deeply excavated.

Microscopic sections prepared from this eye.—Slides 1 & 2. Slightly oblique sections of the optic nerve, from the scleral, choroidal, and retinal apertures. There appears to have been an excavation, judging from the compression of the choroidal aperture. The connective tissue, the blood-vessels, and the normal-shaped bundles of optic nerve-fibres can be recognized.

Slide 3. Transverse sections of the retina, from near the optic nerve, showing the normal retinal elements, though the fibres of the framework are drawn asunder.

Slides 4 & 5. Parallel sections of the optic nerve, from the scleral, choroidal, and retinal apertures. The optic nerve is slightly excavated; the adjoining apertures are well seen: many of the optic nerve-fibres near the margin of the aperture are cut transversely. The optic nerve-fibres, the connective tissue, and the blood-vessels are well seen.

116. A lateral portion of a shrunken and irregularly shaped left eye. The opaque

cornea and the iris are in apposition with each other. The posterior part of the sclerotic is wrinkled and much thickened. Behind the iris is a large cavity, along the walls of which may be seen some of the grey and opaque apices of the ciliary processes, and within which the large chalky lens (now at the side of the preparation) was lying loosely. Neither vitreous nor retina can be recognized; their place is occupied by yellow and opaque fibrous tissue. The brown choroid can be distinguished; small plates and spicules of bone are attached to its inner surface. The optic nerve has been removed, with some of the adjoining tunics.

117. The other portion of the same eye. The large cavity which enclosed the chalky lens is well seen.

W. R., aged 54 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital) states that from the age of sixteen he has suffered from attacks of rheumatism, and soon after he became subject to painful inflammatory affections of the eyes. These attacks were very numerous, both in the eyes and over the body; but whenever the eyes were affected, the remainder of the body seemed in good health. The left eye was excised, October 17th, 1860.

Dissection.—The eye was irregularly shrunken; the place of the cornea occupied by a flat and opaque substance, to which the iris was adherent. Lens changed into a chalky, yellow, opaque, and firm substance, which lay loosely in its much-distended capsule. Vitreous missing. Retina grey-yellow and opaque, thrown into folds, and detached from the choroid. Sclerotic and choroid in apposition and irregularly shrunk, somewhat adapting themselves to the folds of the retina. Sclerotic much and irregularly thickened. The choroid had an equal deep-brown colour.

118. Two lateral portions of a right eye. The section is carried through the middle of the optic nerve, and parallel with the course of the nerve-fibres. The eye is much, though not very irregularly, shrunken. The sclerotic is thickened in the ciliary region; it has retained much of its natural curve; round the optic nerve portions of dark-brown choroid adhere to its inner surface. At one place the anterior part of the ciliary processes and the iris, with an opaque deposit upon its uveal surface, may be seen. The iris is in apposition with the opaque cornea.

M. M. C., aged 18 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy-looking girl, of fair complexion, and whose parents are healthy, states that eleven years ago, after bathing in a river and then running about in the fields, she was seized

with headache. Next day she became feverish, and was confined to her bed for nine weeks, the headache continuing all the time. On the fourteenth day both eyes became watering, inflamed, and painful; in this state they remained for six weeks, after which the left recovered, while vision of the right was reduced to perception of light; lately it has become quite blind. No flashes or muscæ were seen. The right eye was excised, October 12th, 1861.

Dissection.—Eyeball considerably shrunken and squared. Sclerotic much thickened. The choroid had a deep-brown colour, its inner surface round the optic nerve and along the ora serrata covered with a thick deposit of bone; the intermediate portions were thickly sprinkled with calcareous granules. Retina funnel-shaped, detached from the choroid, yellowish and opaque. The space between retina and choroid was occupied by a chocolate-coloured fluid.

119. A lateral portion of an irregularly shaped and considerably shrunken left eye. The large cavity in the interior loosely enclosed a large chalky lens; it is surrounded by a considerable quantity of dense fibrous tissue. The opaque cornea, the thickened sclerotic, and some portions of the brown choroid are the only elements of the eye which can be recognized as such.

120. The other portion of the same eye.

From a girl, aged 10, whose left eye was excised at the Royal London Ophthalmic Hospital, August 14th, 1860.

Dissection.—Cornea: upper two-thirds transparent, lower third opaque. Anterior chamber small. Iris: posterior synechiæ; pupillary area closed by a grey, opaque, dense membrane. The other morbid appearances are seen in the preparation.

121. Two lateral portions of a considerably shrunken left eye, showing a thickened, folded sclerotic, an opaque cornea, and in the ciliary region small portions of choroid with a grey fibrous deposit on their inner surface. The sclerotic belonging to the ciliary region has retained more of its natural curve than the part corresponding to the retinal area.

C. C., aged 30 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a healthy woman, had, fourteen years ago, some inflammation of both eyes, followed by nebulae; to remove these, "powdered copperas" was applied. This was followed, in the left eye, by a severe inflammation, with sloughing of the cornea, and by rapid shrinking of the eye to a small stump. The left eye was excised, September 26th, 1861.

Dissection.—The eye was irregularly shaped, and much shrunken. Optic nerve small, atrophic, pinkish. Crystalline lens, vitreous, and retina missing. Choroid of an almost black colour; firmly adherent to its inner surface was a considerable layer of bone, deposited round the choroidal aperture.

122. The inferior half of a left shrunken eye: the section is carried through the optic nerve. The sclerotic and choroid are in apposition: the latter is pale grey-brown, especially near the optic nerve: both are thickened. Neither vitreous nor crystalline lens was found. The retina, detached from the choroid and changed into a greyish-yellow and opaque substance, may be traced from the optic nerve to its insertion along the ora serrata; it encloses a yellow opaque substance of gelatinous consistence (probably the remains of the vitreous); in front of this is a mass of fibrous tissue which occupies the place of the cornea and adjoining sclerotic, which were removed by abscission five months before excision of the eye.

123. The other half of the same specimen. The retina has been torn off from its attachment round the optic nerve.

124. A portion of fat and muscular tissue, together with part of the white fibrous walls of a unilocular cyst, removed from the apex of the orbit after excision of the above eye. The cyst appeared to have originated from behind the lower part of the sphenoidal fissure, and to have grown into the orbit.

J. F., aged $2\frac{1}{2}$ (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a strong-looking child, had purulent ophthalmia soon after birth. The left eye has always looked larger than the other, and protruded whenever the child cried. When twelve months old, the child had measles, during which the left eye became inflamed, the cornea perforated, and the front part of the eye staphylomatous. The prominent part was abscised, January 1st, 1861. About six weeks later the child began to lose its appetite, and to become restless, and the remaining portion of the eye began to project between the eyelids. The whole was excised, May 14th, 1861.

Dissection.—The place of the cornea was occupied by a greyish translucent, prominent substance, composed of fibrous tissue. Red fluid and coagulated blood escaped from the space between the choroid and the retina. Optic nerve small and grey. The remaining morbid appearances are seen in the preparation.

125. The greater part of the tunics of an enlarged left eye, the section being carried through the optic nerve near its centre, and parallel with its nerve-fibres. The choroid and the retina have become slightly detached along the line of section; the latter is strongly translucent, and appears to have been drawn forwards beyond the ora serrata. The brown choroid, the vasa vorticosa,

and the almost black ora serrata arc well seen. The apices of the ciliary processes are atrophied: part of the iris is spread out upon the staphylomatous tissue, which occupies the place of the cornea; part has disappeared.

M. B., aged 28, milliner (under the care of Mr. Wordsworth, Royal London Ophthalmic Hospital), a thin, delicate-looking, but otherwise healthy person, had, when eighteen months old, a spontaneous severe attack of inflammation in the left eye, which continued for sixteen months, and resulted in loss of perception of light. The eye ever since has looked larger than natural. Five months ago this enlargement increased spontaneously, and the right eye began to suffer from photophobia, lachrymation, and inability to fix objects. The left eye was excised, April 19th, 1861.

Dissection.—Cornea sloughing; part of the contents of the eyeball had escaped during excision. Optic nerve of a pink colour. The hyaloid membrane readily peeled off the retina. Some traces of inflammatory action were seen in a few spots on the choroid.

126. The anterior portion and the superior and inferior halves of the posterior portion of a right eye, the section being carried through the middle of the optic nerve. In the anterior portion, viewed from within, the crystalline lens is seen *in situ*; it is slightly yellowish, and almost transparent in some places, in others its interior has changed in a peculiar manner since its immersion in glycerine. Circumscribed atrophy of the apices of the ciliary processes, and staphylomatous changes of the corresponding tunics of this part of the ciliary region, are seen near the margin of the crystalline lens. The choroid, in the halves of the posterior portion, has a light-brown colour. The retina is translucent, and sprinkled with minute grey, red, yellow, and black patches; it is, except near the retinal aperture, in apposition with the choroid.

A. P., aged 21 (under the care of Mr. Bowman, Royal London Ophthalmic Hospital), healthy-looking, though affected slightly with acne rosacea, suffered, when two years old, from an inflammation in both eyes, which left a slight opacity in the left cornea. Five months ago she noticed an impairment of vision of the right eye. Objects appeared as if seen through a fog; they were seen most distinctly when held opposite the lateral parts of the retina: the flame of a candle, for instance, held sideways, was distinctly seen, whereas it appeared like a confused light when held opposite the region of the yellow spot. Eight weeks later the eye became inflamed spontaneously, after which time it had lost all perception of light; it also began to enlarge during the inflammation. The right eye was excised, December 6th, 1861.

Dissection.—Cornea opaque. Crystalline lens transparent. Vitreous in the ora area yellow, transparent, and viscid; in the retinal area yellow, transparent, and fluid; white and opaque filaments were suspended in different parts of the latter. Optic nerve much swollen and projecting beyond the retinal aperture.

127. A lateral portion of a left eye, comprising part of the cornea, sclerotic, iris, choroid, and retina. The choroid and sclerotic are in apposition; the former has a deep-brown colour, which is chiefly due to its epithelium, through which the vasa vorticosa are dimly seen. Along the ora serrata a narrow rim of choroid is pale brown, as if the epithelium had been stripped off; upon and near this rim are seen a few black dots, caused by changed and displaced choroidal epithelium. A grey opaque portion of displaced retina may be seen close behind the iris.

T. C., aged 19 (under the care of Mr. Bowman, Royal London Ophthalmic Hospital), a chemist, healthy-looking, of fair complexion, with parents in good health, when thirteen years old had a severe attack of inflammation in the left eye, of three months' duration. Vision gradually disappeared; fiery circles were occasionally observed in the eye. The right eye felt weak during the whole time that the other was inflamed. The left eye was excised, May 10th, 1861.

Dissection.—Tension diminished. Cornea translucent. Pupil drawn towards the upper margin of the cornea; its area occupied by a grey and opaque membrane. Retina, at first appeared to be missing, but afterwards was found to have been torn off its attachment round the optic nerve, and to have retracted (as a yellow-grey and opaque substance) upon a fibrous substance which occupied the area of the ora. A grey opaque nodule was seen projecting from the optic nerve into what may be called the choroidal space; the latter was occupied by a chocolate-coloured fluid, consisting of blood-corpuscles, granules, and serum.

128. The outer half of a left eye; the section is carried through the middle of the optic nerve. The eye is small; the curve of its tunics, which are in apposition with each other, is good. The choroid is deep brown; its empty vasa vorticosa can be recognized; its inner surface, particularly in its anterior portion, is sprinkled with minute, well-defined black dots and patches (choroidal epithelium changed and displaced by inflammatory deposits). The iris is in apposition with the opaque cornea. The retina is transparent in some places and translucent in others; in some it is thickened and quite opaque. A pale yellowish-brown portion of retina, with a small brown spot in the middle, is seen near the optic nerve, and represents the macula lutea. The inner (vitreous) surface of the ciliary processes and uveal surface of the iris are lined with a grey, opaque, thick membrane. No crystalline lens was found.

129. The other half of the same eye. The black patches upon the brown choroid

and the thickened opaque portions of the retina are still more numerous. The ciliary processes and the distorted pupil, with anterior synechiæ, are well marked.

W. E., aged 15 (under the care of Mr. Hulke, Royal London Ophthalmic Hospital), a healthy person, had an inflammation of both eyes during infancy (probably purulent ophthalmia). The right eye recovered; the left eye remained smaller and blind. The latter for the last four or five years has been enlarging, and occasionally becomes inflamed, watering, and painful for two or three weeks. No attack has occurred for two years, until a week ago, when it became again inflamed. The right eye always feels weak during the attacks. The left eye was excised, August 2nd, 1861.

Dissection.—Tension normal; size small. Cornea: lower half nebulous; upper half dense, white, and opaque, dotted with cretaceous deposits. Vitreous space occupied by transparent fluid. A fold of displaced retina and hyaloid, extending from the lower margin of the ora serrata to the nearest point of the retinal aperture, projects into the vitreous space: the fold is grey and opaque, and strewed with blood-spots.

130. The anterior half of the tunics of an eye, together with the lens. In the latter are a few grey, opaque peripheral striæ, and through the lens the pupil can be seen; its form is irregular, owing to adhesions of its margin to the capsule of the lens. The posterior synechiæ, the choroid, the ora serrata, and the ciliary processes are well seen; the apices of the latter are more or less distant from the margin of the lens. The sclerotic, choroid, and retina are in apposition.

From a girl, aged 17, whose eye was excised at the Royal London Ophthalmic Hospital, February 12th, 1860.

Dissection.—The eye was small; tension increased. Cornea slightly nebulous. Vitreous changed into a yellowish, transparent, viscid substance; portions of it retained the normal consistence. Tunics in apposition. Retina slightly nebulous; its vessels varicose; all its elements could be recognized. Optic nerve deeply excavated. The other morbid changes are seen in the preparation.

Microscopic sections prepared from this eye.—Slide 1. Parallel sections of an excavated optic nerve. The walls of the excavation are lined by debris from the nerve-fibres; the nerve adjoining the excavation has a yellowish tint.

Slide 2. Sections of the retina from the region of the yellow spot. The outer and inner granular layer, the layer of retina adjoining these, and the fibres of the framework are visible; the rods and bulbs cannot be recognized.

Slides 3 & 4. Portions of choroid from the region of the yellow spot, showing the stellate pigment and the epithelium.

131. The outer and lower half of the anterior portion of a left eye. Behind the

flat cornea and the iris, which is almost in apposition with it, is seen one half of the translucent crystalline lens; and behind it the dark-brown ciliary processes, the ora serrata, and the light-brown choroid, which last is in apposition with the sclerotic, and the pigment of which is visible through some translucent flocculent vitreous humour and through the translucent retina.

132. The corresponding half to the last preparation, after removal of the retina, hyaloid membrane, and crystalline lens, showing an anterior synechia of the iris and the contrast of colour between the ciliary and retinal choroid.
133. The retina, suspensory ligment, and crystalline lens removed from the last specimens.

C. B., aged 24 (under the care of Mr. Bowman, Royal London Ophthalmic Hospital), a lacemaker, of delicate health. Since the age of two years both eyes have felt weak; they have suffered almost every year from photophobia, lachrymation, and redness, accompanied by supraorbital and occipital pains, the attacks lasting from three weeks to three months. Both eyes suffered simultaneously, but never to the same extent, sometimes the one, sometimes the other having been most severely affected. The last attack occurred three months ago. Five years ago both eyes were particularly bad, especially the left, which then became blind, though up to that time vision had been tolerably good. A few months before the loss of sight in the left eye, the patient noticed occasionally, whether the eye was closed or open, sparks and various colours (red, blue, green, yellow) running into each other; these have disappeared since vision was lost, but for the last six weeks similar colours are observed with the right eye. The left eye was excised, October 8th, 1862.

Dissection.—Tension considerably increased even after excision. Optic nerve grey, opaque, and small. The eye has a somewhat squared shape; its tunics are thinned and staphylo-matous behind the insertion of the inferior rectus. The cornea showed a central opacity, and there was anterior synechia of the iris. Lens transparent. Tunics in apposition. The vitreous had a golden-yellow tint, and was perforated by numerous blood-clots in the ciliary and by a few in the retinal area, the clots projecting from these regions into the vitreous space. The choroid had a pale-brown colour, was a little atrophied near the choroidal aperture, but covered with large varicose vessels in the region of the yellow spot. Retina transparent, highly anæmic; only a few thin blood-vessels perceptible; a few capillary hæmorrhages in some parts. Optic nerve deeply excavated.

134. A posterior portion of the tunics of a right eye, together with part of the optic nerve; the latter is excavated. The vasa vorticosa, the brown stellate pigment of the choroid, and a few circumscribed, roundish, atrophic, trans-

parent portions of choroid may be observed. The retina is almost transparent; part of it near the optic nerve is raised into circumscribed elevations detached from the choroid.

135. Another portion of the same eye. A considerable part of the strongly translucent retina has become detached from the choroid; the atrophic state of some parts of the latter is well seen.

The eye was excised from a patient of the Royal London Ophthalmic Hospital, December 9th, 1858.

Dissection.—Cornea nebulous; anterior chamber small. Iris has contracted posterior synechiæ. Lens yellowish, large, transparent; its capsule opaque to the extent of the pupillary area. Vitreous yellowish, transparent, viscid. Tunics in apposition. Retina transparent, sprinkled with minute, roundish blood-spots. Optic nerve waxy grey-white and opaque, deeply excavated. Choroid: the insular arrangement of its deep-brown stellate pigment well seen, as also the vasa vorticosa; its anterior and equatorial portions show numerous round, transparent, atrophic patches.

136. An equatorial portion of a left eye, comprising the sclerotic and choroid, preserved in glycerine. The preparation shows the changes which have occurred in the pigment of the choroid during and subsequent to inflammation of that membrane. The choroid, much thinned and of a pale-brown colour, is spotted with white and black well-defined patches, the former being transparent atrophied portions of the membrane, the latter accumulations of pigment-granules of its epithelium.

A. F., aged 57 (under the care of Mr. Bowman, Royal London Ophthalmic Hospital), a seamstress, pale, and lately suffering from frequent attacks of rheumatism, lost the sight of the left eye, twenty-five years ago, during an attack of inflammation, which she attributed to exposure to a cold draught in summer weather. There was purulent discharge from the eye, which soon subsided; but redness and lachrymation continued for twelve months. She has had numerous similar attacks of redness and lachrymation in the same eye, the last about nine months ago. The right eye felt weak, and lately has been quite useless whenever the left was inflamed. The left eye was excised, March 12th, 1861.

Dissection.—Eyeball rather large. Lens missing. Vitreous space: the area of the ora and ciliary processes occupied by vitreous; the area of the retina occupied by transparent fluid. The tunics were in apposition with each other. The optic nerve was slightly cupped. Retina transparent, tumid, atrophic. Choroid as seen in the preparation.

Microscopic sections prepared from this eye.—Slide 1. Parallel sections of the retina, from between the outer retinal aperture and the region of the yellow spot. The rods have dis-

appeared. The granules of the choroidal epithelium are in apposition with the outer limitans. Only one granular layer, but no other retinal elements, can be recognized. The fibres of the framework are changed into lacunæ; the parallel fibres of the optic nerve are perceptible.

Slides 2-4. Parallel sections of the optic nerve from the scleral, choroidal, and retinal aperture. The optic nerve is deeply excavated; only its connective tissue, but no nerve-fibres, can be recognized. The walls of the excavation are lined with granular débris; the bottom of the excavation is level with the upper margin of the scleral aperture. The layer of nerve-fibres is reduced to one-fifth its normal thickness.

137. An anterior lateral portion of the tunics of a right eye, showing an excessive staphylomatous condition of the tissue which has replaced the cornea, with proportionate thinning and stretching of the adhering iris. Some of the ciliary processes can be recognized, others are, like the iris, flattened out upon the staphylomatous tissue.

T. G., aged 6 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy-looking boy, had purulent ophthalmia of both eyes in infancy; since which the right eye has been gradually enlarging. The staphylomatous part of the eye was burst three weeks ago by a blow; the wound soon healed, and the staphyloma continued as before. The left eye suffers from photophobia and lachrymation. The right eye was excised, November 16th, 1861.

Dissection.—Besides the morbid appearances seen in the preparation, the choroid had in some places a deep brown, in others a mottled black and brown colour. Retina transparent; retinal vessels few and thin; optic nerve slightly excavated. Vitreous changed into a viscid transparent fluid.

138. The greater part of a considerably shrunken left eye, showing a thick deposit of bony substance upon the inner surface of the choroid. Neither lens nor vitreous was found. The yellowish-white opaque and funnel-shaped substance in the interior of the eye is the displaced retina. The curve of the sclerotic is good. The brown choroid, though mostly detached from the sclerotic, has likewise preserved its curve. The yellowish-white and opaque bony substance is thickest near the optic nerve; it does not extend beyond the middle of the choroid, where the latter is sprinkled with numerous white calcareous dots; the opaque flat cornea, the iris, and the anterior part of the displaced retina are in apposition with each other.

J. B., aged 18½ years (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy-looking person, of dark complexion, had purulent ophthalmia in infancy, followed in

the left eye by considerable impairment of vision, and at the age of four by staphylomatous enlargement of the eye. The operation of abscission was performed, which for some time was followed by an irritable state of the right eye; this subsided spontaneously. One year ago the left eye became subject to frequent short attacks of inflammation, with pain in the region of the fifth nerve, and attended with pain, photophobia, and lachrymation of the right eye. The left eye was excised, August 8th, 1860.

Dissection.—Size and tension diminished. Shape normal. Optic nerve small. A brownish turbid fluid full of cholestearine crystals occupied the space between the choroid and retina. The other morbid appearances are seen in the preparation.

139. The staphylomatous portion of a left eye, consisting of a large prominent leucoma surrounded by a greyish translucent, thin and staphylomatous cornea, and by some sclerotic. Attached to it are a few atrophied ciliary processes and some débris of pigment. A small roundish yellowish-white and opaque substance (the crystalline lens), enclosed in a large and almost transparent capsule, and surrounded by opaque shreds of vitreous, lies at the side of the preparation.

From a patient under the care of Mr. Lawson. The disease commenced in an attack of purulent ophthalmia. The eye was excised, August 16th, 1860.

Dissection.—The condition of the cornea and iris is seen in the preparation. Lens healthy. Sclerotic, choroid, and retina healthy, except a small portion of the ora serrata near the staphylomatous part of the cornea; there, an opaque fibrous deposit was seen upon the choroid. Peripheral portions of the vitreous healthy; central portion changed into transparent fluid.

Microscopic sections prepared from this eye.—Slide 1. Portions of the lamina fusca, of the ciliary nerves, of the choroidal vessels, and of its epithelium.

Slides 2 & 3. Portions of the ciliary muscle.

Slides 4 & 5. Portions of lamina fusca, of the ciliary nerves, of the choroidal vessels, and of its epithelium.

Slide 6. Large portions of the choroidal epithelium, showing the clear transparent round centre of the epithelial cells, their periphery being occupied by brown pigment-granules; portions of the elastic lamina may also be seen.

Slide 7. Large portions of the choroidal epithelium, showing the clear transparent round centre of the epithelial cells, their periphery being occupied by brown pigment-granules; portions of the elastic lamina may also be seen, besides portions of choroid with the light-brown stellate pigment-cells.

Slide 8. Portions of choroid from the region of the yellow spot.

Slides 9 & 10. Parallel sections of the retina, about two-tenths of an inch distant from the outer portion of the yellow spot. The thickness of the retina is normal in some parts, and very much increased in others; in the swollen portions only its granules can be recog-

nized ; in the other portions the rods, the remainder of the framework, and the optic nerve-fibres may be recognized.

Slides 11-20. Transverse sections of the retina, three-tenths of an inch from the lower margin of the retinal aperture. The rods can nowhere be recognized ; in many places the outer granular layer is also destroyed, apparently through some effusion from the choroid ; many portions of the outer, and the entire inner granular layer, the elements of the retina, between the latter and the optic nerve-fibres, and the transversely cut bundles of optic nerve-fibres can be recognized, as well as the corresponding portions of the framework. Beneath the bundles of optic nerve-fibres may be seen a considerable layer of fibres, which take a rectangular course to the optic nerve-fibres.

Slides 21-23. Transverse sections of the retina, half an inch from the inner retinal aperture. The rods and the remainder of the framework, the granular layers, the layer immediately beneath the optic nerve-fibres, these fibres themselves, and the retinal vessels, can be recognized.

Slides 24-27. Portions of choroid from the region of the yellow spot. Most of the blood-vessels are cut transversely ; the light-brown stellate pigment is abundant ; on a level with the chorio-capillaris may be seen nests of nuclei of about the size of blood-corpuscles, intermixed with fibres, as if part of the effusion which had furnished the nuclei had developed into the fibres. This effusion has in many places perforated the elastic lamina, spreading beneath the retina and displacing the choroidal epithelium. The displaced portions of the latter have become black. Numerous particles of rods may be seen adhering to the granules of the choroidal epithelium.

Slides 28-33. Parallel sections of the retina from the region of the yellow spot. The outer and inner granular layer, the fibres of the framework intervening between the two, the optic nerve-fibres, and the other retinal elements, together with the remainder of the framework, can be recognized.

Slides 34-41. Transverse sections of the retina, about one-tenth of an inch from the upper margin of the retinal aperture. The rods and the remainder of the framework of the retina may be seen, especially those bundles of the fibres of the framework which pass between the optic nerve-fibres, to reach the inner limitans. The granular layer and the other retinal elements, as well as the transversely cut bundles of optic nerve-fibres, can be recognized.

Slide 42. A portion of the hyaloid membrane drawn off the retina, about two-tenths of an inch from the upper retinal aperture ; it appears as an amorphous, almost transparent membrane sprinkled with minute granules ; in several places it is thrown into folds.

Slide 43. Four transverse sections of the retina, about three-tenths of an inch from the upper margin of the retinal aperture. The retinal elements, the framework, and the blood-vessels can be recognized.

Slide 44. Three transverse sections of the retina, one-tenth of an inch from the inner margin of the retinal aperture, and carried across two of the retinal blood-vessels. The framework of the retina (the fibres between the bundles of the optic nerve-fibres and the outer and inner limitans) can be recognized ; numerous granules, probably an effusion from the choroid, occupy the place of the rods. The granular layers, the retinal layer beneath the optic nerve-fibres, the transversely cut bundles of the optic nerve-fibres, and the trans-

versely cut blood-vessels of the retina, gorged with blood-corpuscles, can be recognized. Immediately beneath the retinal layer which lies nearest the optic nerve-fibres, a peculiar layer of oval nuclei may be noticed.

140. The lateral half of a left eye, the section being carried through the optic nerve and parallel with its nerve-fibres. The eye is much enlarged; the sclerotic and the brown choroid are in apposition; the yellow and opaque substance within the latter consists of the detached retina and the contents of the vitreous space thickly infiltrated with pus, &c. The cornea is much thickened, and is also infiltrated with pus. The chambers, the lens, and the iris cannot be recognized. The retina has been torn off from its attachment to the optic nerve.

W. P., aged 10 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), lost the vision of the left eye, after an attack of measles, five years ago; the eye was then very painful and bloodshot. Three months ago, the patient having caught cold, the eye again became inflamed and very painful. The right sympathizes, suffering considerably from photophobia and lachrymation. The left eye was excised, January 7th, 1860.

Dissection.—The place of the cornea occupied by leuco-staphylomatous tissue. Crystalline lens missing; its capsule much thickened. Iris infiltrated with pus. Yellow, transparent, very viscid fluid occupied the space between the choroid and the retina. For the remaining morbid appearances, see description of the preparation.

141. A lateral portion of an irregularly-shaped, considerably shrunken left eye. The structures observed from without inwards are the folded, thick sclerotic, then the brown choroid, then a thick bony substance, then fibrous tissue; in front of this is a chalky disk-shaped substance occupying the place of the crystalline lens, and the thickened iris in apposition with the opaque cornea.

142. The other portion of the same eye.

S. S., aged 16 (under the care of Mr. Lawson, Great Northern Hospital), in general good health, had small-pox seven years ago, during the suppurative stage of which a pustule formed upon the left eye: it appears from the patient's account that the eyelids were much swollen for several weeks; vision was completely lost; the eye gradually decreased in size. It has occasionally been very painful, especially during exertion of the right eye, which, however, has never sympathized. The left eye was excised, August 29th, 1861.

143. A disk-shaped portion of the tunics and of the interior of a shrunken irregularly-shaped left eye. The irregularly thickened sclerotic, and a brownish

narrow strip of choroid are the only elements of the eye which can be recognized as such; the interior of the eye is occupied by dense fibrous tissue, much resembling that of the sclerotic.

G. T., aged 4 (under the care of Mr. Poland, Royal London Ophthalmic Hospital), a healthy-looking boy, had scarlatina four months ago; during the illness, the left eye was observed to enlarge and become painful. Poultices were applied; after the removal of one of these, the tunics gave way, and the contents of the eyeball escaped. For the past six weeks the eye has been shrinking and very painful. A month ago the right eye began to sympathize. The left eye was excised, February 20th, 1860.

Microscopic sections prepared from this eye.—Slide 1. Three transverse sections of the optic nerve from the scleral aperture, showing a commencing atrophy of the connective tissue and of the bundles of optic nerve-fibres, together with a decrease of the diameter of the blood-vessels.

144. The anterior part of the tunics of a left eye, together with the greyish translucent lens *in situ*. From the outer side may be seen a roundish space in the iris from which the pigment is absent, with anterior synechia near the pupillary margin. The tunics are in apposition with each other; the choroid has a light-brown colour; the ora serrata and the ciliary processes are well marked; the grey opaque apices of the latter are very near the margin of the lens.

H. O., aged 29 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), had typhoid fever at the age of 17, and again at 36; she now suffers every winter from chronic bronchitis. A year ago some dust was blown into the left eye; it caused a low inflammation with hypopyon, and ulceration of the lower half of the cornea; after five months this terminated in a leuco-staphylomatous condition of the lower region of the cornea, with anterior synechia and entire loss of vision. Flashes of light were noticed in the eye during coughing; they have ceased since the loss of perception of light. A darting pain in the eye has continued since the loss of vision. The right eye sympathizes. The left eye was excised, March 9th, 1860.

Dissection.—Tension increased. Shape: slightly squared. Cornea: upper half transparent, lower half opaque and staphylomatous. Iris: lower half adherent to the cornea. Lens transparent; the ciliary processes were in immediate apposition with the periphery. Vitreous: viscid within the retinal, normal within the ciliary area. Tunics in apposition. Retina transparent. Optic nerve deeply excavated; retinal vessels as large in it as in the retina. The choroid had a uniform brown colour.

145. The outer lateral half of the tunics of a right eye, the section being carried through the middle of the optic nerve and parallel with its nerve-fibres.

The tunics are in apposition. The almost transparent retina is in some places thrown into delicate folds. The contrast between the light-brown choroid and the black ciliary processes and uvea is well marked. Along the ora serrata is a greyish opaque deposit of inflammatory products. The retina near the optic nerve appears unusually thin. The iris is in apposition with the opaque tissue which occupies the place of the cornea; a small greyish translucent misshaped substance is all that is left of the lens.

J. T., aged 18 years, female (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), states that while recovering from scarlatina, nine years ago, the right eye became inflamed, and continued so for about five months, terminating in a leucomatous condition of the cornea, and reduction of vision to mere perception of light. She has since frequently suffered from attacks of pain, both in the eye and supraorbital region, sometimes so severe as to confine her to bed for days together. The left eye for the last two or three months has been painful when the patient was working at small objects, and a mist (without colours) is perceived round the flame of a candle. The right eye was excised, September 27th, 1861.

Dissection.—The place of the cornea was occupied by a flat opaque fibrous tissue. Vitreous: in the ciliary area of normal consistence; in the retinal area changed into transparent fluid. Retina transparent, in apposition with the choroid. The yellow spot appears black, with a white dot in the centre. The remaining morbid appearances are described in the account of the preparation.

146. Four portions of the tunics of a right eye. The two portions with the black membrane attached to the sclerotic are the two lateral portions of the anterior half of the eye. The serrated boundary between the brown choroid and the almost black ciliary processes (the ora serrata), and the slightly opalescent capsule of the lens, are well seen.

The two other portions are from the posterior part of the eye; in the one the greyish slightly translucent retina has been removed, to show the healthy brown choroid in apposition with the sclerotic; in the other may be seen a small portion of the optic nerve with the folded greyish translucent retina.

W. R., aged 4 (under the care of Mr. Lawson, Great Northern Hospital), a healthy boy, of fair complexion, one year ago had measles; during his recovery, specks were observed on both eyes, one of which burst while he was coughing, and was followed by a staphylomatous enlargement of the front part of the eye. The eye changes much in size; appearing very large whenever the boy is out of health; at other times it is almost as small as the left. No redness of the eyes was observed. The opacity disappeared from the left eye, which however is weak, suffering from lachrymation and photophobia, and pain when it is used. The right eye was excised, August 15th, 1861.

147. The anterior portion of the tunics of a right eye, together with the greyish translucent lens. The sclerotic, the brown choroid, and the almost transparent retina are in apposition; the ora serrata and the ciliary processes are well marked; the apices of the latter are drawn forwards far beyond the margin of the lens. The iris is adherent by its irregularly contracted pupillary margin to a grey opaque substance, which occupies the place of the cornea.

T. C., aged $4\frac{1}{2}$ (under the care of Mr. Poland, Royal London Ophthalmic Hospital), when one week old, had purulent ophthalmia, from which he recovered; about six months ago he was laid up for nine weeks with scarlatina; in the fifth week a speck was noticed on the right eye; this increased, and while the child's face was being washed it gave way, allowing the escape of some portion of the contents of the eyeball. A bluish-white opacity of the cornea remained, which after a few weeks began to become staphylomatous. The right eye was excised, December 1st, 1860.

Slides 1-4. Somewhat oblique sections of the optic nerve from the scleral aperture. The connective tissue, the bundles of optic nerve-fibres, and, in some sections, the blood-vessels can be recognized.

Slides 5 & 6. Parallel sections of the retina from near the equator. The rods and bulbs, and the framework of the retina, as also the retinal elements, are well seen.

Slides 7-10. Transverse sections of the retina. All the elements of the retina can be recognized; in some of the sections the insertion of the framework of the retina into the inner limitans is particularly well seen.

Slide 11. Four sections of the choroid from the region of the yellow spot, showing the choroidal epithelium, the choroidal blood-vessels, the stellate pigment, and the other tissues of the choroid.

Slide 12. A large portion of retina, with the corresponding portion of choroid preserved in glycerine.

Slides 13-15. Sections of the sclerotic from near the insertion of the inferior oblique muscle. The fibrous tissue of the sclerotic, the so-called lamina fusca, and, in some sections, the passage of the blood-vessels and ciliary nerves through the sclerotic can be recognized.

Slide 16. Several portions of choroid deprived of their epithelium, and showing the empty vasa vorticiosa.

Slide 17. A dried portion of choroid, showing a considerable deposit of lime upon its epithelial surface.

Slide 18. A large portion of choroidal epithelium. The epithelial pigment-cells with their transparent central spaces are well seen; they are of tolerably equal size.

Slide 19. A portion of choroid, with portions of ciliary nerves.

In the eight following specimens, the disease appears to have been of syphilitic origin.

148. A lateral portion of a left eye, the section being carried through the cornea near its middle. Neither vitreous, retina, nor lens was found. The sclerotic and choroid are thickened and infiltrated with pus and lymph; the vitreous space and the chambers are occupied by the same; some of the pus is seen protruding through an opening in the sclerotic, near the margin of the cornea.

J. B., aged 41 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a strong man, of fair complexion, had two attacks of primary syphilis, the second of which was treated with mercury. During the second attack the left eye and the left side of the nose became inflamed, accompanied by an offensive discharge and escape of small pieces of bone from the latter. He remained well for twenty-one years, suffering only from chronic mucous discharge from the left lachrymal sac. In August 1858 he had perforating ulcer of the left cornea with prolapse of the iris. In January 1859 there was extensive corneal opacity, but "useful vision." In January 1860, while on the watch at night, a sudden coldness was felt in the eye; the next morning it was very painful and bloodshot, and had lost all perception of light. In February there was chemosis and pus in the anterior chamber. The eye was excised on the 20th of this month.

Dissection.—Much fibrin and cellular tissue were intimately adherent to the outer surface of the sclerotic. The central portion of the surface of the cornea was ulcerating and infiltrated with pus; a large prolapse of the iris had taken place at the upper ulcerating margin. Vitreous space filled with pus and lymph. Retina yellow and opaque, thickened by infiltration with pus; its inner surface covered with a thick network of blood-vessels. Choroid œdematous, thickened; much pus deposited upon its inner surface.

Microscopic sections prepared from this eye.—Slide 1. Three transverse sections from the optic nerve where it passes through the scleral aperture, showing the central blood-vessels, connective tissue, the optic nerve-fibres, and the outer circular fibres.

149. The anterior portion of the tunics of a right eye, together with the crystalline lens. The latter is dirty grey and opaque; it is, together with the iris, pushed forwards upon the cornea; the pupil is closed, irregular, and bears the traces of former iritis. Many of the ciliary processes are destroyed; the grey opaque substance deposited upon the choroid near the ora serrata is a layer of fresh lymph. The sclerotic and choroid are in apposition; the latter has shrunk back towards the ora serrata.

150. The posterior portion of the tunics of the same eye, together with the optic nerve; the latter appears as a greyish-white and opaque circumscribed spot,

surrounded by the light-brown choroid ; the empty transparent vasa vorticosa are well seen ; the inner surface of the choroid is sprinkled with numerous well-defined black patches, many of which resemble bone-corpuscles in shape. The sclerotic and the choroid are in apposition ; along the line of section upon the inner surface of the choroid is a nodular grey opaque substance ; this is lymph ; attached to it, and extending across the interior of the eye to the optic nerve, is an almost transparent membrane, a portion of detached retina ; the remainder of the retina is transparent and in apposition with the choroid.

The eyeball was excised and presented by Mr. Jonathan Hutchinson. The patient had lost vision during an attack of secondary syphilis twenty years before its removal. The eye had since been subject to repeated accessions of inflammation.

Dissection.—Shape and tension normal. Cornea slightly nebulous ; iris almost in apposition with it ; pupil irregular, contracted, and closed. Lens grey and opaque. Vitreous space occupied by yellowish, slightly turbid fluid. Retina strongly translucent, partly *in situ*, partly detached from the choroid, stretching across the vitreous space and adhering to a considerable effusion of lymph upon the surface of the choroid in the equatorial region.

151. A lateral posterior portion of the tunics of a right eye, the section being carried along the margin of the optic nerve and parallel with its fibres. The retina is strongly translucent, and in greater part in apposition with the choroid ; the latter is deep brown, the vasa vorticosa are faintly seen ; its inner surface, especially near the equatorial portion, is thickly sprinkled with minute black dots and patches.

From a patient who had suffered from secondary syphilis, during which the sight of the right eye was lost. It was excised, September 19th, 1860.

Dissection.—Cornea transparent. Tension diminished. Anterior chamber small. Iris discoloured ; area of the pupil occupied by a grey and opaque substance ; pupil fixed. Ferruginous, white and opaque particles of lens were contained within the capsule. Vitreous missing ; its place occupied by transparent fluid. Tunics *in situ* ; much grey and opaque inflammatory tissue deposited upon the ora. Retina translucent and swollen round the retinal aperture, elsewhere transparent ; its vessels few and thin.

Microscopic sections prepared from this eye.—Slide 1. Two portions of choroid from near the ora serrata. From some parts the choroidal epithelium has been removed artificially to expose the choroid proper, and to show the difference of colour when deprived of its epithelium. The hexagonal shape and the relative apposition of the cells are destroyed. They vary in size ; some are without pigment-granules, in others the granules are changed in colour. The ciliary nerves and vasa vorticosa may be seen.

Slide 2. Two parallel sections of the retina with the corresponding portions of choroid,

one-eighth of an inch distant from the optic nerve, near the insertion of the inferior oblique muscle, showing the framework of the retina, the granular layer, the layer of cells immediately beneath the optic nerve-fibres, and the optic nerve-fibres themselves. In the choroid they show the stellate pigment, the vasa vorticosa, the derangement, change of shape and colour of the choroidal epithelium, and of the elastic lamina.

Slides 3-7. Parallel sections of the retina, with the corresponding portions of choroid. These all show a loss of transparency of the retina, caused by a derangement and a slightly yellowish tint of its framework. The choroidal epithelium is in some places destroyed, in others displaced, thrown into heaps, and pushed into the retina. In the adjoining retina the rods are accordingly displaced, detached, or torn asunder.

Slides 8-12. Transverse sections of the retina and of the choroid, two-tenths of an inch from the optic nerve outwards and upwards. They show the optic nerve-fibres (their bundles being cut transversely); the retinal blood-vessels, the granular layers, and the framework of the retina; parts of the latter, that is, the rods and bulbs are much disturbed in their relative position,—in some places bent, curled up, or torn asunder, in other places thickly sprinkled with pigment-granules from the hexagonal cells.

Slides 13 & 14. Transverse sections of the retina and of the choroid, from near the outer and upper part of the optic nerve. In these the destruction and disturbance of the framework of the retina have extended further towards the optic nerve-fibres, in some places quite reaching them. The optic nerve-fibres can everywhere be recognized; wherever the granules of the granular layer are perceptible they appear healthy. Lacunæ of different size, resembling large cellular spaces, are formed by the distortions of the fibrous framework of the retina.

Slide 15. Portions of choroid, showing the stellate pigment, the vasa vorticosa and the ciliary nerves, a portion of the ciliary muscle, and a portion of the so-called lamina fusca, presenting a number of light-brown pigment-cells, which resemble a network of ganglion-cells.

Slides 16-20. Parallel sections of the retina and choroid, two-tenths of an inch from the lower margin of the optic nerve. These show in the choroid the vasa vorticosa filled with blood-corpuscles, blood-serum, and with transparent cells of about four times the size of blood-corpuscles, which generally lie nearest the walls of the blood-vessels; a morbid state of the elastic lamina and of the choroidal epithelium, the elastic lamina being sprinkled with small and large brownish and black patches (accumulations of changed choroidal epithelium).

In the retina the optic nerve-fibres may be seen in all the sections. The fibres of the framework are distorted or destroyed or bent, the rods are completely destroyed; in many places parts of the framework, with granules of the granular layer, are adhering to the choroid; in other places may be seen a yellowish dark line of unequal thickness in the situation of the outer limitans, probably caused by the rods being pushed towards it.

Slides 21-25. Parallel sections of the optic nerve from the choro-retinal aperture. In several of the sections portions of retina may be seen attached to the periphery of the optic nerve. The optic nerve-fibres, the connective tissue, and the blood-vessels can be recognized. Numerous minute brown pigment-granules among the elements of the optic nerve, and a yellowish tint of the nerve-tissue, are the only peculiarities observable.

152. An equatorial portion of the tunics of a left eye, showing numerous black well-defined pigment-patches (the traces of some former inflammation) upon the light-brown choroid, and seen through the almost transparent retina.
153. The optic nerve and part of the adjoining tunics of the same eye. The nerve is slightly oval, pink, and well defined; some of the retinal blood-vessels can be recognized. The brown choroid is viewed through the almost transparent retina. A few small black pigment-spots are also perceptible in this part of the choroid. The deep reddish-brown colour of the choroid near the optic nerve is due to some extravasation of blood. About two lines from the optic nerve may be seen a limited deeper brown, somewhat roundish portion of choroid; this is the region of the yellow spot.

J. W., aged 18 (under the care of Mr. Dixon, Royal London Ophthalmic Hospital), a tall thin man, presenting the characteristic appearance and history of one suffering from inherited syphilis. About eight years ago he gradually lost his hearing, and simultaneously with it his power of speech. The eyes were subject to lachrymation from infancy, but vision was good until ten years ago, when both became inflamed; attacks of inflammation were repeated every spring and autumn, each lasting for about two months. In February 1853 he was an out-patient of the hospital, with "suppuration in the substance of the right cornea." In June 1858 he had a large sclerotic staphyloma of the left eye, and the right pupil was closed with old deposit. The patient was never troubled with *museæ*, flashes, stars, &c., nor did he ever complain of pain. The left eye had lost all perception of light, and was excised, November 14th, 1861.

Dissection of the eye.—Shape oval, ciliary region staphylomatous. Cornea advanced. Optic nerve outside the scleral aperture, partly greyish translucent, partly yellowish white and opaque. Cornea translucent; iris in apposition with cornea; pupil contracted. Lens transparent. Ciliary processes atrophied. Choroid: colour moderate brown; its retinal surface sprinkled with large and small, round and oval, black pigment-patches; a slight crescent at the outer periphery of the optic nerve (choroidal aperture). Retina *in situ*, transparent, its veins rather full; yellow spot marked. Optic nerve slightly excavated. Vitreous: normal consistence in the area of the ora, partly fluid, partly viscid in the area of the retina. The lens, iris, and ciliary region appeared displaced and expanded by the increased contents of the vitreous space.

154. The anterior half of a left eye. The cornea has been removed. The iris seems adherent to the lens. The pupil is irregular, and its area occupied by grey and opaque tissue. The lens is *in situ*, but opaque. Portions of the ciliary processes near the ora serrata are destroyed, their place being occupied by atrophic choroidal tissue. The retina, choroid, and sclerotic are in apposition.

R. A., aged 57, a master mariner (under the care of Mr. Poland, Royal London Ophthalmic Hospital), presented himself in April 1860, for relief of pain in the left eye. The patient, a strong, dark, healthy-looking man, had, except syphilis, never had any illness. Thirty years ago he suffered from a chancre on the penis, followed by secondary symptoms; from this he is said to have recovered. About a year later both his eyes felt weak for a short time. This weakness, with slight mistiness of sight, returned in the spring of the six following years, when the left eye became slightly painful, much inflamed, and its sight considerably impaired; the inflammation subsided after about two months' mercurial treatment, but vision remained reduced to perception of large objects. An attack of inflammation of equal duration occurred three years later, which deprived the eye of all perception of light. Three weeks ago, while suffering from a severe cold, the blind eye became red and intensely painful, the pain extending over the branches of the fifth nerve. The eye was excised, April 28th, 1860; the pain subsided the same day. The right eye (in which a few posterior synechiae were perceptible) had, according to the patient's account, never been inflamed, yet the sight was not as good as he wished it to be. He can, however, read medium type with convex glasses, and attend to his work on board ship.

Dissection of the eye.—Tension much increased, being almost as great after as before excision. The globe somewhat squared, owing to the resistance offered by the recti muscles to the intraocular pressure. Tissue of the cornea the seat of an abundant deposit of calcareous molecules and granular matter. Anterior chamber contained pus, flocculi of lymph, and turbid serum. The pigment among the circular fibres of the iris had a dirty rust-brown colour; the radiate fibres were grey and opaque; the area was seen beyond. The pupil was irregular, contracted, and firmly adherent to a grey translucent membrane which occupied its area. The tunics were in apposition. The choroid had a deep-brown colour, which was intersected by transparent lines (the vasa vorticosa); the clusters of stellate pigment-cells being separated from each other by the veins, were of a different shape in the region of the yellow spot and round the optic nerve from those in the equatorial region: the clusters appeared deeper brown in some than in other parts; hardly any pigment appeared accumulated upon the veins.

Microscopic examination.—The stellate pigment-cells, beyond their deep-brown colour, appeared healthy; the circular fibres of the arteries were perhaps too well marked: the veins were enlarged and flattened out between the retina and sclerotic; the capillaries were much enlarged, and in many instances filled with chalk-granules; the elastic lamina had in a few places retained its defined outline, in others it had disappeared or become obscured by the morbid changes on its retinal surface. The hexagonal cells had everywhere disappeared; their pigment-granules (of a light-brown colour) were scattered about, some in clusters, others in lines over the surface of the elastic lamina.

Microscopic sections prepared from this eye.—Slide 1. Two parallel sections of the retina and choroid from the region of the yellow spot. The part of the framework of the retina between the inner granular layer and between the choroidal epithelium is much disturbed, the fibres of the framework being distorted and torn in different directions; the corresponding retinal elements have disappeared; the optic nerve-fibres and the inner granular layer can be recognized; traces of an effusion from the inner surface of the choroid are perceptible in many places.

Slide 2. Three parallel sections of the retina, and five sections of the choroid at one-tenth of an inch from the inner periphery of the optic nerve. The retina is much reduced in thickness; the optic nerve-fibres and some of the adjoining retinal elements, with the corresponding portions of its framework, can be recognized. The remainder of the retina appears to have been destroyed by some effusion from the choroid.

155. The lateral halves of the anterior part of the tunics of a right eye, the section being carried through the cornea, lens-capsule, &c. The cornea has been removed, and the iris exposed, together with a grey opaque substance occupying part of its anterior surface and the entire area of the pupil; behind and adhering to this substance is the thickened, opaque, and distended capsule of the lens,—the lens itself having been removed. The greyish-white opaque and slightly flocculent membrane, which appears attached to the posterior surface of the lens-capsule, is the detached and opaque retina. The sclerotic and the deep-brown choroid are in apposition. The ciliary processes are hidden from view by a dense, greyish-white, and opaque inflammatory deposit upon their inner surface.

J. N., aged 11 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), is a fair, delicate-looking thin boy, with teeth notched, as observed in cases of inherited syphilis. His parents appear healthy. A year ago the right eye became inflamed, and vision was gradually lost. Some time after the left eye became inflamed, and vision was impaired. Present state:—Left eye: tension, size, and shape normal; a small, ill-defined, nearly central opacity in the cornea; iris brown; anterior synechiæ of the upper pupillary margin; pupil irregular, not very active. On ophthalmoscopic examination, the fundus was seen to be uniformly brownish red; optic nerve red; blood-supply to retina normal. Right eye: tension diminished, the eye very soft; shape normal, much capillary redness of the ciliary region; cornea transparent, scarcely any anterior chamber; iris brown; pupil closed by a greyish opaque substance, and drawn outwards and downwards; no perception of light. The right eye was excised, February 5th, 1861.

Dissection.—Tension diminished. Eyeball soft. Shape: slight bulging of the sclerotic beyond its general curve, below and external to the insertion of the inferior oblique muscle. Cornea: a few faint diffused opacities, elsewhere transparent; a very small quantity of transparent fluid in the anterior chamber; grey, opaque tissue adhered to the anterior surface of the iris, and occluded the pupil; no communication with posterior chamber. Crystalline lens milky and opaque; much grey and opaque tissue deposited upon the ora, the ciliary processes, and the hyaloid fossa. No vitreous present. Retina grey, funnel-shaped, detached, opaque, swollen, traversed by large blood-vessels, and its outer surface sprinkled with pigment. Yellow viscid transparent fluid between choroid and retina.

Microscopic sections prepared from this eye.—Slides 1–3. Sections of the choroid from near the equator of the eye. They show the tissue proper of the choroid, the vasa vorticiosa, and

the arteries cut transversely, the chorio-capillaris, together with some morbid deposit round them, and the disturbed state of the choroidal epithelium.

Slide 4. A transverse section of the optic nerve, taken from the level of the lower margin of the choroidal aperture.

Slide 5. Two transverse sections of the optic nerve, taken from the level of the upper margin of the choroidal aperture. These show the blood-vessels, the inner and outer circular fibres, the remainder of the connective tissue, and the bundles of optic nerve-fibres.

Slide 6. Two transverse sections of the optic nerve, from the retinal aperture, showing the same as the last two sections, the connective tissue being less distinctly marked.

Slide 7. Three transverse sections of the optic nerve, from the level of the upper margin of the retinal aperture, showing the same as the last, besides some of the retinal elements.

The nine following specimens are taken from eyes which were recognized as glaucomatous during life.

156. A lateral part of the tunics of a right eye, with the swollen grey and opaque lens *in situ*; the periphery of the latter presses upon the apices of the ciliary processes. The sclerotic, the brown choroid, and the almost transparent retina are in apposition. Along the ora serrata are seen atrophic portions of choroid. The grey membrane which projects into the vitreous space from the ora serrata is part of the vitreous changed in a peculiar manner.

E. P., aged 58 (under the care of Mr. Critchett), a thin, highly nervous female, of dark complexion, suffering from ulceration of the cervix uteri, and general ill-health. She began to wear glasses at the age of 50. The right eye was struck by a piece of wood two years ago; since then she has had occasional attacks of dimness of vision, lasting from one to three hours, and becoming more frequent of late. Iridectomy has been performed. Four weeks ago, while she was laid up with sickness, a severe pain was felt suddenly in the left eye and in the corresponding frontal region; the eye became bloodshot, and the sight obscured by a thick mist. The right eye was excised, May 25th, 1860.

Dissection.—Shape globular. Cornea slightly nebulous; scarcely any anterior chamber. Iris dirty blue, atrophic; the mark of the operation (iridectomy upwards) is apparent. Lens large, grey, and opaque, touching the ciliary processes. Vitreous healthy. Tunics in apposition. Retina transparent; its elements could be recognized in many places. Optic nerve: no vessels visible; it did not appear excavated. The choroid had a normal brown colour near the ora serrata; in other parts a few atrophic and transparent patches were seen; a brown, well-defined dot marked the region of the yellow spot.

Microscopic sections prepared from this eye.—Slides 1–10. Transverse sections of the retina from the equator of the eye. The vitreous humour appears yellow; the whole of the retina has a dirty-grey colour; the rods, the fibres of the framework, and the two granular layers can be distinguished. The fibres of the optic nerve and the inner limitans are destroyed in some, and perceptible in other places.

Slide 11. Parallel sections of the retina and of the adjoining ora, showing the choroid, the ora, and the retina; large lacunæ among the fibres of the framework, but no optic nerve-fibres, no rods, and very few granules.

Slide 12. Parallel sections of the retina from near the optic nerve; the rods, and parts of the outer granular layer are destroyed; the inner granular layer and the optic nerve-fibres can be recognized.

157. A lateral portion of the sclerotic and choroid of a right eye, with part of the large greenish-grey and opaque lens *in situ*, pressing upon the apices of the adjoining ciliary processes. The sclerotic and the brown choroid are in apposition; the pigment of the latter, especially near the ora serrata, is highly atrophic, the choroid being rendered almost transparent.
158. The opposite portion of the same eye. The choroid is almost transparent, nearly the whole of its epithelium having disappeared. The lens has been removed, so as to show better the grey opaque apices of the ciliary processes and the atrophic iris.

A. S., aged 75 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital). General health good, has been working at silver and other bright work for the greater part of his life. He began to wear convex glasses thirty years ago, on account of inability to recognize fine work without them. For the last five years he has had slight attacks of pain in the right eye, and suddenly lost the sight of it three years ago, a day or two after having applied some leeches for the relief of pain. The eye has continued blind, and has been very painful at times. It was excised on July 4th, 1861.

The left eye has been subject to glaucomatous attacks, complicated with glittering flashes of light, though he could read the newspaper for a quarter of an hour at a time. Tension was much increased; there was no anterior chamber, the ciliary vessels were enlarged. Iridectomy was performed, September 27th, 1859. The lens presenting, portions of it were removed. A troublesome inflammation followed; the pain was most relieved by poultices. A month after the operation he could recognize fingers at four to nine inches from the eye, and best opposite the inner part of the retina. On June 8th, 1861, vision was reduced to faint perception of shadows opposite the inner part of the retina; the remainder blind.

Dissection of the right eye.—The eye was small, flattened from above downwards, and its tunics were staphylomatous behind the insertions of the outer and inner rectus. Optic nerve small, atrophic. Cornea slightly nebulous. Anterior chamber small. Lens large, grey, and opaque. Vitreous diminished in quantity, but normal in appearance. Retina transparent where in apposition with the choroid; strongly translucent where detached (from its aperture to the equator) from that membrane; its substance sprinkled with minute round blood-spots. Optic nerve excavated. Transparent fluid occupied the space between the detached retina

and the choroid. Stellate pigment of the choroid scanty. Epithelium missing at the staphylomatous portions.

Microscopic preparations prepared from this eye.—Slide 1. Sections of the retina. The inner limitans and the fibres of the optic nerve cannot be perceived; the place of the rods is occupied by an obscurely granular layer; the outer limitans is obscure; the adjoining granular layer is perceptible; many perpendicular lacunæ, filled with blood, may be seen among the fibres of the framework nearest the outer granular layer.

Slides 2–4. Transverse sections of the retina: the optic nerve-fibres are perceptible, but scarcely any granules or other retinal elements can be distinguished; numerous lacunæ are noticed among the rods; the outer and inner limitans, and the fibres of the framework are perceptible.

Slide 5. Section of a glaucomatous optic nerve from the scleral, choroidal, and retinal apertures; no optic nerve-fibres can be distinguished; large lacunæ are perceptible in the connective tissue.

159. An antero-lateral portion of the tunics of a right eye, together with the corresponding portion of a greyish translucent and slightly displaced lens. The sclerotic, the light-brown choroid, and the almost transparent retina are in apposition. The ora serrata and the ciliary processes are well seen. The ciliary muscle appears very small.

160. The opposite portion of the same eye. The lens has been removed. The retina is detached from the choroid along the line of section.

From a lady, aged 60 (a private patient of Mr. Dixon), whose right eye was attacked suddenly in October 1859 with intense pain, accompanied by sickness; vision was lost, and the pain has continued ever since, chiefly confined to the globe, or extending a little into the superciliary region. The eye was excised, February 1st, 1861.

Dissection.—Tension increased. Shape slightly squared. Cornea slightly nebulous. Anterior chamber good. Pupil large, round, fixed. Crystalline lens yellowish, transparent. Vitreous rather viscid. Tunics in apposition. Retina transparent, sprinkled with small, roundish, fresh and old blood-spots, especially in the equatorial region. Optic nerve grey, waxy, anæmic, and excavated. The choroid had a uniform light-brown colour.

Microscopic sections prepared from this eye.—Slides 1–6. Transverse sections of the retina from the region of the yellow spot; the retinal layers and the fibres of the optic nerve are destroyed in parts, or entirely; the rods, the outer limitans, and the outer and inner granular layers can be recognized; the fibres separating the outer and inner granular layers have an undulating course.

Slides 7 & 8. Portions of choroid from near the inner margin of the choroidal aperture, showing the brown stellate pigment; the ciliary nerves and numerous small and large round grey, white, and opaque spots among the choroidal epithelium giving an appearance as if the latter had been perforated by some substance escaping from the chorio-capillaris.

Slides 9-14. Transverse sections of the retina, a tenth of an inch from the inner margin of the retinal aperture. The retina appears swollen, more so in some parts than in others; the place of the rods is occupied by an obscurely granular substance. The outer and inner limitans and the fibres of the framework may be recognized; the two granular layers and the retina appear healthy; no optic nerve-fibres are visible, but large lacunæ may be seen in the fibres of the framework where the optic nerve-fibres ought to be.

Slides 15-21. Parallel sections of the retina from near the upper part of the ora. No rods can be recognized; large perpendicular lacunæ are perceptible among the fibres of the framework. The two granular layers and the inner retinal layer, the fibres of the framework, and the inner limitans can be recognized. The fibres of the optic nerve are much distorted. The blood-vessels of the retina are large and flattened.

Slides 22-29. Transverse sections of the retina, a tenth of an inch from the retinal aperture. The vitreous humour has a yellowish tint. The rods, mixed up with some granular matter, can be recognized only in a few places; the outer and inner granular layers can be distinguished, but their arrangement is much disturbed; numerous lacunæ are perceptible among the fibres of the framework; no optic nerve-fibres can be recognized.

Slide 30. Portions of the ciliary nerves and the so-called lamina fusca.

Slide 31. Atrophic portions of the choroid and chorio-capillaris.

Slide 32. A portion of choroid, showing the ciliary nerves and the choroidal arteries, and the pigment-cells of the lamina fusca; it appears as if a communication existed between the filaments of the ciliary nerves and these cells.

Slides 33-35. Portions of choroidal epithelium and of the elastic lamina of the choroid.

Slide 36. Portions of a ciliary nerve with some choroid attached to it.

161. A posterior lateral portion of the sclerotic, choroid, and retina of a right eye; the former two tunics are in apposition; the grey, translucent, folded retina lies at the side of the sclerotic and choroid; the latter has a light-brown colour, and appears healthy.

From a lady, aged 50 (a private patient of Mr. Critchett). Vision of the right eye was lost two years ago; the eye has lately become painful. It was excised, November 8th, 1861.

Dissection.—Shape globular. Tension increased. The central portion of the cornea nebulous; the epithelium round this part peeling off. Anterior chamber good. Pupil of medium size, round. Crystalline lens transparent. Tunics in apposition. Vitreous normal, except near the optic nerve, where it had a viscid consistence. Retina transparent, with various-sized fresh blood-spots between the equator and the ora serrata; the blood-vessels appeared thin. Optic nerve deeply excavated, grey-blue, and opaque; the blood-vessels are compressed upon the outer walls of the excavation.

162. The anterior portion of the tunics of a glaucomatous left eye, together with the very large translucent crystalline lens, the margin of which is distinctly seen pressing upon the adjoining apices of the ciliary processes. The ora serrata

is well marked. The tunics are in apposition. The somewhat irregular large pupil is visible through the translucent cornea.

B. B., aged 65, a carpenter (under the care of Mr. Poland), had been in good health until ten years ago; he then had a severe attack of jaundice with delirium; he recovered after one month; some years later he had an attack of rheumatism, and has since suffered from shortness of breath. The heart-sounds are normal, but frequently intermittent. He has used his eyes much, and five years ago had recourse to glasses for small objects. Three years ago, while looking at some saw-teeth, a flickering and mist appeared before the left eye; this subsided after some rest; two years ago the same eye became spontaneously bloodshot and painful, with a marked decrease of sight, especially at night. For the last eighteen months the eye has been quite blind, and periodically very painful, especially at night.

The sight of the right eye has become gradually misty during the last six months, and the eye periodically painful, more so at night. At present he reads large type with this eye with difficulty at about ten inches distance, and much better opposite the inner nasal parts of the retina. Distant objects appear only as shadows. On ophthalmoscopic examination the retinal vessels appeared very thin, and the retina throughout closely sprinkled with brown-red patches. There were also some floeculi in the vitreous. The left eye was excised, September 21st, 1859.

Dissection.—Tension increased. The centre of the cornea nebulous, its epithelium peeling off. Pupil irregular, oval; margin of iris adhering to the capsule of the lens. Anterior chamber normal. Crystalline lens yellowish grey and opaque. Vitreous yellowish, of normal consistence, clots of blood diffused through it. Tunics in apposition. Retina transparent, spotted with brown patches and with minute blood-spots. Choroid of uniform brown colour. Optic nerve excavated, opaque and white; no blood-vessels were seen on the nerve.

163. Part of a left slightly shrunken eye, the section being carried through the optic nerve and parallel with its nerve-fibres; no lens was found, and only a small quantity of vitreous humour. The retina has become yellow and opaque, and together with the choroid is displaced towards the vitreous space by the yellowish-brown flocculent substance, which is seen immediately within the sclerotic, consisting of coagulated and discoloured blood and fibrin.
164. Another portion of the same eye. A part of the tunics has been removed to show the discoloured blood and fibrin between the sclerotic and choroid. The hæmorrhage is more particularly confined to an equatorial part of the choroid and to the adjoining ciliary processes; the section is also carried through a cicatrix in the ciliary region, and shows the absence of the chambers and of the iris, and the adhesion of the retina to the cicatrix.

P. S., aged 71, a jeweller (under the care of Mr. Streatfeild), had been in good health until two years ago, when he suffered from carbuncles on the neck, accompanied by sloughing of a large portion of skin. He appears to have completely recovered. He has used magnifying-glasses for the last thirty years, because without them he could not do small work. The right eye was always stronger than the left. Six weeks ago, while walking, a sudden mist with a sensation "of sand in the eyes," but unaccompanied by pain or flashes of light, obscured the sight of the left eye. Dimness of vision increasing, the lens was extracted. The eye was afterwards excised, October 7th, 1859.

165. A lateral portion of the anterior half of a *myopic* left eye. The place of the cornea is occupied by a yellow opaque substance, which retained somewhat the natural curve of the cornea, except in one part, where the greyish-yellow and opaque substance which may be seen in the interior of the eye projects beyond that curve. This substance consists of pus, lymph, and other inflammatory products, together with the detached retina, agglutinated together within the area of the ciliary processes. The sclerotic presents its usual curve and thickness. The choroid is brown and slightly detached from the sclerotic; it is hidden from view, from the ora serrata forwards, by inflammatory products.

166. The other half of the anterior portion of the same eye.

167. A lateral part of the posterior half of the same eye, the section being carried through the optic nerve parallel with its nerve-fibres, showing the sclerotic and choroid in apposition, and an abnormal curve and a thinning of the choroid and of the sclerotic near the optic nerve. The very oblique direction in which the optic nerve approaches the eye and passes through its tunics may also be observed.

R. F., aged 42 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), in delicate health, states that fifteen years ago, on going out too soon after a confinement, she caught cold, which was followed by rheumatic pains in the head, continuing for twelve months; among other things she was treated with shower baths, after one of which, being exposed to draught, the left eye became inflamed and swollen (within twelve hours after the bath), so that the lids could not be opened, accompanied by purulent discharge. Ten days later, on applying at the hospital, "the eye was lanced"; she then could still perceive fingers when the eyelids were raised. Four weeks later, after the swelling had subsided, perception of light was lost. Ever since that time the eye has been subject to attacks of inflammation

whenever the patient caught cold or was otherwise out of health, sometimes attended with pain in the supraorbital region. It was excised, June 28th, 1861.

Dissection.—Optic nerve healthy. Eyeball much enlarged, especially between the insertions of the oblique muscles. Cornea opaque in some parts, vascular in others ; there was a yellow opaque protrusion beneath the conjunctiva near its lower margin, consisting of pus which proceeded from the interior of the eye. Lens transparent, small, enclosed within a thickened and opaque capsule, and pushed upon the ciliary processes opposite to the spot where the pus had passed through. For the other morbid appearances, see description of the preparation.

C.—*New Growths originating in the tissues of the Eyeball, or in the Orbit.*

168. The lateral half of an unusually large and elongated right eye, the section being carried through the optic nerve. An irregular, nodular, melanomedullary growth is seen adhering to the outer surface of the sclerotic, at or near the optic nerve. The latter is changed in shape, much enlarged just before entering the sclerotic, and infiltrated with medullary substance, blending the nerve and sheath into one. Numerous melanotic nodules of different sizes may be seen in the interior of the eye, as well as melanotic infiltrations of the choroid and of the ciliary processes. At one part of the section the entire thickness of the sclerotic is occupied by melanotic deposit. No vitreous substance was found. The grey, opaque, thin, folded, and funnel-shaped membrane, which extends from the optic nerve to the hyaloid fossa, is the displaced retina ; its outer surface is sprinkled with melanotic spots ; it is on one side firmly adherent to the nodular masses which grew from the choroid. The remainder of the space between the retina and choroid was filled with a turbid chocolate-coloured fluid. The sclerotic and the choroid are in apposition. The lens is *in situ* ; it is greyish yellow and opaque.
169. Three equatorial portions of the sclerotic and choroid from the same eye. The inner surface of the deep-brown choroid is sprinkled with irregularly shaped, well-defined, and rather large black patches.
170. The posterior somewhat conical-shaped half of a left myopic eye, from the same patient. The sclerotic and the choroid are in apposition. The retina

is greyish, strongly translucent, and is in many places thrown into delicate folds. The choroid is light brown and thin near the optic nerve; it assumes a dark-brown tint in its equatorial portions. A few small black pigment-dots near the optic nerve mark the choroidal portion of the yellow spot. A narrow, crescentic, transparent portion of choroid skirts the adjoining part of the optic nerve. At the optic nerve, before it enters the scleral aperture, is a nodular enlargement, being a development of medullary cancer.

171. The anterior half of the same eye. The lens is *in situ*; it is strongly translucent. The tunics are in apposition. In the choroid are peculiar fissures parallel with and extending from the ciliary processes.

J. S. H., aged 25 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a man of dark complexion, brown irides, and sallow yellowish look, generally strong and in good health, though subject to colds. No history of syphilis can be traced, nor have tumours been known to occur in the family. He was always near-sighted; never could recognize persons across a street, and held books at from four to six inches from the eye when reading; concave glasses did not improve vision for reading. Seven years ago the right eye occasionally became painful and swollen, especially during a "cold," and he accidentally found that he had no perception of light with this eye; some time before this he had noticed a white substance in it. For the last six weeks the attacks of pain and of swelling of the right eye have become very severe. The left eye felt weak, objects appeared darker, perception of light became less acute, and symptoms of asthenopia showed themselves. The right eye was excised, August 8th, 1860.

September 25th.—The faintest perception of light exists in the left eye when patient gets up; it becomes quite blind during the day. The ophthalmoscopic appearances are natural; pupil large, fixed, round, its area clear: there is complete paralysis of the inner rectus and of the inferior oblique muscle, and to a less extent of the superior and inferior rectus. There is a thin, yellow, purulent discharge from the right orbit, and slight chemosis of the conjunctiva; no tumour can be felt in the orbit. The pain has much increased, especially during the last week, extending over the malar, temporal, and orbital branches of the fifth nerve; there is also a numbness of the skin in the region of the superior and inferior maxillary nerve. Pulse 120 in the minute. Auscultation and urine normal.

The following particulars were obtained from friends of the patient:—Dec. 7, 1860. General state low; feet swollen; appetite very good. Dec. 8. The same. Dec. 9. Patient seems in very great pain both in head and stomach; a dose of castor oil given. Dec. 10. Somewhat better; has passed a tolerably good night. Dec. 11. Scarcely any appetite; complains of pain in the head. Dec. 13. The swelling of the legs much diminished; but there seems no power in the jaw to take anything but spoon-food. Dec. 14. Appetite very good. Dec. 19. Some bleeding from the nose. Dec. 20. Continued bleeding from the nose during the day. Dec. 21. Continued bleeding from the nose. Dec. 22 as 21. Appetite entirely gone.

Dec. 23. Passed a very restless night; great pain in head and chest. Dec. 24. Bleeding from the nose ceased; feet, legs, and nose very cold. Dec. 26. Seemed to have great difficulty in drawing his breath for half an hour: died this afternoon. It should be mentioned that the patient's speech became impaired in September, and that in November he could no longer articulate words.

The body was examined twenty-four hours after death. The contents of the thorax and abdomen were perfectly healthy. Both orbits were free from new growths, the optic nerve alone being changed. The blood-vessels of the brain and the membranes gorged; much yellowish, transparent fluid was accumulated between the brain and dura mater. The substance of the brain was very watery. Numerous medullary tumours, of the colour and consistence of the brain itself, and smooth on their outer surface, were found attached to most of the cranial nerves at their point of emergence from the brain and in their further course. A medullary tumour, of the size of a pea, was seen projecting from the inner and back part of the anterior lobe of the cerebrum, attached to the internal or short root of the olfactory, where it appeared on the surface of the brain. Similar nodular medullary tumours (two on the right and three on the left side) were seen projecting from the brain-substance at the margin of either optic tract, where the tract passes from the crura cerebri upon the tuber cinereum. Midway between the commissure and the optic foramen, the left optic nerve measured $\frac{1}{5}$ th of an inch, the right only $\frac{1}{4}$ th of an inch in diameter; both nerves appeared flattened. There was no change of colour; but the bundles of nerve-fibres of the right nerve appeared to be less in number; the connective tissue seemed thickened; nearer the commissure, both nerves were of the normal thickness. In the orbit, $\frac{1}{3}$ rd of an inch from the optic foramen, the right optic nerve appeared smaller than the left; this decrease of size was less than within the cranium. Both nerves, before entering the optic foramen, were enlarged, forming tumours of the size of a hazel-nut; these adhered firmly to the bone, pushing the covering dura mater towards the cerebral cavity. Both nerves, just beyond the optic foramina, were again slightly enlarged, but each resumed its original thickness at about an eighth of an inch from the foramen, thence passing on to the eye; the optic foramina were not enlarged.

The right third nerve, where it emerges from the brain, appeared healthy; the left, at the margin of the pons Varolii, was enlarged into a medullary tumour of the size of a hazel-nut, which chiefly projected from the portion of the nerve nearest the pia mater; the nerve seemed of normal thickness after emerging from the tumour. Both the third nerves (within the cranium, and $\frac{1}{6}$ th of an inch from the point where they pass through the dura mater) were enlarged into medullary tumours of the size of peas, firmly attached to and somewhat spreading out on the inner surface of the dura mater.

No medullary growth was found in the course of the fourth and sixth nerves; the left sixth nerve was much flattened where it passed over the enlarged Gasserian ganglion.

The intracranial portion of the left fifth nerve appeared healthy; the right fifth, from where it emerged at the pons Varolii to the aperture in the dura mater, was enlarged into a medullary tumour of the size of a hazel-nut. Both the Gasserian ganglia were changed into medullary tumours as large as walnuts, destroying the surrounding bones, and projecting into the cranial cavity, covered by the dura mater.

A similar and symmetrical enlargement into small medullary tumours was found in both the seventh nerves, just before their exit from the cranium. The medullary substance spread out and adhered to the inner surface of the dura mater; developing itself from the nerve, it appeared to have been arrested for some time where the nerve passed through the dura mater, and to have poured itself over the inner surface of the latter.

The greater part of the dura mater on the left side having been removed, and the Gasserian ganglion, &c., exposed, the internal carotid was seen to be surrounded by medullary substance, which extended from the optic foramen towards the outer aspect of the sella turcica. Extensive hæmorrhage had occurred beneath the dura mater and round the left Gasserian ganglion.

172. The greater part of the tunics of a right eye, together with the greyish-white and opaque lens; the section is carried through the middle of the optic nerve and parallel with its nerve-fibres. The grey, opaque, funnel-shaped substance which runs across the interior of the eye from the optic nerve to the lens is the displaced retina and hyaloid. The sclerotic and the brown choroid are in apposition. A nodular, melano-medullary growth (probably originating in the outer surface of the choroid) projects into the space between the choroid and the detached retina; the longest diameter of its base extends from the region of the yellow spot to the nearest portion of the ora serrata. Only a small portion of choroid adjoining the chief mass of the tumour is infiltrated with melanotic substance. The ciliary processes and the ora serrata are hidden from view by the displaced retina and by the suspensory ligament.

J. P., aged 46, a shoemaker (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a strong-looking man, of fair complexion, and general good health, had good eyes until September 1859, when, while cutting leather, it appeared to him as if the cutting-board were slanting, and, on closing the left eye, found that the distorted appearance was due to some change in the right eye. A similar apparent distortion of all objects continued as long as the vision of the eye remained. The distinction of distant objects disappeared before that of things placed close to the eye. In March 1860, the right eye, having lost all vision beyond the mere perception of shadows, one night suddenly became bloodshot and painful, with considerable chemosis. A hazy state of the lens was also noticed. The inflammatory symptoms subsided after eight weeks, the eye resuming its former healthy appearance, but remaining blind. Lately there have been slight attacks of pain in the right eye, and the left has felt weak. The right eye was excised, July 30th, 1860.

Dissection.—Shape and size normal. Cornea transparent; iris in apposition with it. Pupil irregular, fixed. Lens grey and opaque. Vitreous missing; a small quantity of blood effused close behind the lens. Retina funnel-shaped, detached, thrown into folds,

yellowish grey, slightly translucent; much choroidal epithelium was adherent to its outer surface. Transparent, yellowish, glairy fluid occupied the space between the choroid and retina, besides the melanotic tumours, which, adhering to and projecting from the choroid in the region of the yellow spot, had the size of a small hazel-nut. The relation between the sclerotic and choroid was not otherwise disturbed.

173. A portion of a left eye (the section being carried through the optic nerve), showing a circumscribed, melanotic, cancerous growth, which originated from the choroidal region of the yellow spot, and has grown towards the optic nerve and into the interior of the eye, leading, among other changes, to a displacement of the retina, which is greyish, opaque, and thrown into delicate folds. The lens is large, yellow, and opaque, and pushed towards the cornea. The sclerotic and brown choroid are in apposition.

M. C., aged 45 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a healthy-looking woman, of fair complexion and nervous temperament, at the age of seven suffered severely from measles, at nine from smallpox; for the last thirteen years has been troubled with asthma and cough during winter, and for two or three years past has had swelling of the legs, with marked diminution of the quantity of urine. Up to the age of sixteen she had frequent attacks of ophthalmia, with lachrymation and symptoms of asthenopia. Since that time the eyes have been stronger; but she has never been able to do needle-work for longer than an hour at a time, without an aching of the eyes with confusion of vision. Eighteen months ago she suddenly noticed that objects seen with the left eye appeared surrounded by a mist; the dimness was greatest on the nasal side of the eye. For the last two months, perception of light has been entirely lost. About a year ago patient observed, during three months, that when entering a dark room she saw little bright stars, fiery circles, &c. A week ago the left eye became intensely painful, the pain extending over the forehead and temple. The right eye suffers from photophobia, pain, and inability to fix objects. The left eye was excised, March 8th, 1860.

Dissection.—Shape slightly squared. Cornea transparent. Iris in apposition with it. Pupil irregular, dilated, and fixed. Lens transparent, pushed forwards. Vitreous missing. Retina greyish, translucent, funnel-shaped, and detached from the choroid. A melanomedullary tumour, of the size of a hazel-nut, and originating in the choroid near the yellow spot, projected inwards: yellow, transparent fluid occupied the remainder of the space between the choroid and retina.

Microscopic sections prepared from this eye.—Slides 1–3. Three portions of a melanotic intraocular new growth, consisting of amorphous black molecules.

174. The lateral half of a left eye, the section being carried through the middle of the cornea. The lens has been removed from the opaque, distended capsule.

Neither retina nor vitreous can be distinguished, and the choroid has also in great part disappeared. The interior of the eye is occupied by a grey and chocolate-coloured, floeculent cancerous growth. Portions of a similar growth are seen adhering to the outer posterior surface of the sclerotic.

A. T., aged 50 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a woman of general good health, has never worn glasses. Her right eye appears healthy; the left began to fail twelve years ago; black spots (*muscæ*) were observed in it, and a peculiar change of vision took place, the lower half of objects only being seen. Vision was entirely lost within a year; but the appearance of the eye was not altered until seven months ago, when it became inflamed spontaneously, and protruded from the orbit, and was extremely painful. The left eye was excised, January 20th, 1860.

Dissection.—The shape of the eye is changed by a melanotic mass adhering to its outer surface, near the optic nerve. Cornea transparent. Iris pushed forwards. Pupil fixed, contracted. Lens grey, opaque, and soft. Retina and vitreous missing, their place being occupied by a chocolate-coloured, melanotic substance. The choroid could be traced along the sclerotic; but portions of the latter are brownish and discoloured, as if a communication existed between the growth within and without the eyeball.

175. The lateral half of a right eye, with a melanotic cancerous growth adhering to the outer posterior surface of the sclerotic. The sclerotic and the choroid are in apposition. The yellow, opaque substance within is an effusion between the choroid and retina; the latter, thrown into folds and detached, is greyish, translucent, and may, together with some changed vitreous substance, be seen in front of the effusion. The cornea is large, and the iris is almost in apposition with it.

J. D., aged 56 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a sallow, thin, yellow-looking man of dark complexion, states that he has generally enjoyed good health. About eight years ago he observed, one day while exposed to sun and wind, that the right eye became irritable, and black spots appeared to be floating before it: soon after, vision became impaired; objects appeared surrounded by a fog, which increased until, after two years, sight was entirely lost; no flashes of light, &c., were observed. Shortly after the loss of vision, pain came on in the eye and over the corresponding side of the head: this pain frequently returned, especially when the patient caught cold; it subsided on the application of lead-lotion. The eye was never bloodshot, and was not changed in appearance until six months ago, when the patient accidentally observed that it appeared to be larger than usual; during the last two months this appearance has increased rapidly, and the hearing of the same side has become impaired. The eye was not tender when touched, but there was much pain over the right side of the head. The right eye was excised, April 9th, 1861.

Dissection.—The shape of the eye was scarcely changed, though there was a large, firm, melanotic tumour adhering to the outer posterior half of the sclerotic, causing exophthalmus. No melanotic tumour was perceptible within the eye. Tension slightly diminished. Cornea transparent. Anterior chamber shallow. Pupil dilated, irregular; a yellow, opaque reflection emanated from its area. Crystalline lens large, dirty yellow, and opaque. Retina and vitreous missing. Sclerotic and choroid in apposition. The space behind the lens was occupied by a gelatinous, yellowish substance, resembling vitreous, and by a peculiar yellowish, chalky, soft substance.

Microscopical sections prepared from this eye.—Slides 1 & 2. Sections of the retina from near the equator. The portion of the framework between the outer granular layer and the optic nerve-fibres can be recognized; it encloses few granules and numerous brown pigment-molecules. The rods, the optic nerve-fibres, and the retinal elements immediately beneath the optic nerve-fibres have disappeared.

Slides 3 & 4. Sections from the melanotic growth: they show a dense network of short fibres and of small cells, almost completely hidden from view by large, irregularly shaped, deep-brown pigment-masses.

Slide 5. A portion of choroid from the equator, showing the disturbed state of the choroidal epithelium, the almost transparent choroidal tissue being sprinkled with deep-brown pigment-molecules, with irregularly shaped pigment-cells.

176. The lateral half of a melano-medullary growth, together with some of the soft parts of the orbit and portions of a thickened shrunken sclerotic. No other elements of the eye can be recognized.

177. The opposite half of the same specimen.

E. W., aged 66 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), a healthy-looking woman of fair complexion, lost the left eye many years ago; the right has recently been destroyed by a cancerous tumour, which at the time of removal protruded from the orbit. This was excised, June 6th, 1859. On dissection nothing of the eye could be distinguished, except the portion of sclerotic seen in the preparation.

178. The posterior and lateral portion of a left eye, the section being carried through the middle of the optic nerve and parallel with its fibres. The optic nerve is on one side separated from its sheath by a melanotic cancerous mass, which appears to have originated in the choroid, and also to have grown into the interior of the eye, displacing the retina. The retina is greyish white and opaque, and loosely attached to the choroid; it is, near the optic nerve, surrounded by the melanotic growth, across which it can be traced

as a greyish-white and opaque line. The more central portion of the new growth and a portion nearest the sclerotic have the flocculent, yellow, and opaque appearance of medullary cancer.

G. W., aged 40 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), farm-labourer, in general good health, noticed eight years ago a dimness of the sight of the right eye. This gradually increased. Four years ago he could still see to read with the eye; after a time he could only see objects when held on the temporal side of the eye, *i. e.* opposite the inner peripheral parts of the retina. One year ago he still had perception of shadows with the eye; but for six months it has been blind, and since then has become inflamed and painful. The pain was felt in the eye and over some of the branches of the fifth nerve; it increased on moving the eye. Little fiery sparks have been occasionally observed in the left eye for the last two years; but otherwise it is healthy. The right eye was excised, March 27th, 1860.

Dissection.—The shape of the eye was changed by a melanotic growth projecting from its sclerotic surface, near the optic nerve. Cornea transparent. Chamber good. Aqueous humour yellowish. Pupil fixed, of medium size. Lens yellowish transparent. Vitreous reduced in bulk by one-third, partly of normal consistence, partly viscid. The tunics are in apposition in the anterior half of the eye; but the retina and choroid are detached from each other and from the sclerotic in the posterior half. The retina, where it is in apposition, is transparent; the detached portion is strongly translucent and greyish.

179. The posterior half of the tunics of a right eye, the section being carried through a melano-medullary growth, which, apparently originating in the choroid, forms a nodular projection into the interior of the eye. The sclerotic and the brown choroid are in apposition. The grey-white and opaque folded substance, which projects into the interior of the eye from its back part, is a portion of the retina remaining attached only round the optic nerve. A small part of the adjoining choroid is implicated in the new growth, near its most projecting part.

J. C., aged 50 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a woman of fair complexion, with blue eyes, and general good health. She had worn convex glasses for thirty-six years. Sixteen months ago she observed numerous museæ moving before the right eye; they appeared suddenly one evening; vision at the same time was much impaired. The museæ increased in number, but have not been seen for the last four weeks, vision having been quite lost for that period. Six weeks ago the eye became rather suddenly painful and inflamed; these symptoms were on the increase, the pain extending over some of the branches of the fifth nerve. The left eye did not sympathize. The right eye was excised, April 18th, 1860.

Dissection.—Shape normal. Tension slightly diminished. Cornea slightly nebulous.

No iris was perceptible. The large pupillary space was occupied by the lens, which appeared pushed forwards, its glistening margin being seen. Vitreous missing. Retina detached, funnel-shaped, greenish grey, and opaque. Sclerotic and choroid in apposition: the latter appeared healthy, except in the region of the yellow spot, where it was infiltrated with melanotic substance, and perforated by a melano-medullary tumour of the size of a hazel-nut, which projected into the space between the choroid and retina, and was surrounded by yellow, transparent, very glutinous fluid.

180. The lateral half of a left eye, the section being carried through the optic nerve. The optic nerve, two-thirds of the sclerotic, and the cornea and iris can be recognized. The other parts of the eye are destroyed; their place is occupied by a yellowish-grey and opaque, partly flocculent, partly fibrous-looking cancerous growth.

E. C., a boy, aged 4 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), the fifth of a family of seven children: his mother has good general health; his father suffers from "scrofula and skin-eruptions." A year ago the child had a fever, after recovery from which, his hair fell out, he lost appetite, became pale, and began to cough. Fifteen months ago the mother first observed a "shining reflection" in the pupil of the left eye, which at times was less visible, at others it appeared to increase; it disappeared after the fever. The eye then looked "dull" and was "inflamed" for six weeks; the inflammation afterwards subsided; but for the last month the eye has become painful, the pain increasing when it was touched. The right eye appeared healthy. The left was excised, March 26th, 1860, and at once examined. He was discharged from the hospital a few days after the operation.

On the 4th of July he was admitted into the Hospital for Sick Children, Great Ormond-street, under the care of Mr. Athol Johnson, with a medullary growth projecting from the left orbit, and which had displaced the glass eye he had worn. The growth, which at times bled profusely, was excised, and the patient was dismissed on the 2nd of September. The tumour was entirely removed from the orbit, except a small portion which could be felt protruding through the foramen opticum. There was abundant purulent discharge and swelling of the glands on the left side of the neck. Patient was readmitted on the 24th of the same month with fresh medullary growth in the left orbit, and with profuse suppuration of the much-enlarged cervical glands. On the 14th of November it was found that the right eye had lost the perception of light. The eye appeared healthy; the pupil was very sluggish and dilated. He died on the 4th of December, exhausted by the suppurating cervical glands and by the sloughing and bleeding of the surface of the orbital medullary growth.

Dissection of the left eye.—The shape of the eye was rendered irregular by some nodular swellings occupying the thickness and the outer surface of the posterior portions of the sclerotic. Cornea transparent. Iris in apposition with cornea. Lens grey, opaque, and soft. Vitreous, retina, and choroid missing. A yellow, opaque, grumous substance occupied the ciliary area of the vitreous space. A soft, reddish-white, and opaque, pulpy sub-

stance filled the remainder of the interior of the eye; portions of the sclerotic were replaced by a deposit similar to that in the interior of the eye. The pulpy substance consisted of slightly brownish transparent cells, of the size of blood-corpuscles.

181. The lateral portion of a right eye, the section being carried through the middle of the cornea and iris. The lens has been removed. Neither vitreous nor retina was found. A reddish-grey flocculent growth occupies the greater part of the interior of the eye; a nodule of the same substance is seen adhering to the outer surface of the sclerotic. Behind the lens-capsule, and in front of the new growth, is a flocculent substance of a pinkish colour, the changed vitreous. The sclerotic is thin. The greater part of the choroid has disappeared, its place being occupied by the new growth.

W. S., aged 7 (under the care of Mr. Dixon, Royal London Ophthalmic Hospital), a delicate-looking boy, of dark complexion, with enlarged tonsils. Three years ago his mother observed a yellow reflexion from the pupil of his right eye when he looked sideways. For the last twelve months the eye has lost the perception of light. Four months ago it became painful, and it has been gradually increasing in prominence. The right eye was excised, November 3rd, 1859.

Dissection.—The shape of the eye was rendered irregular by a hard tumour adhering to its outer surface, near the optic nerve, of the size of a hazel-nut, and consisting of grey opaque and medullary substance. Cornea transparent. Iris hidden from view by the deposit of an amber-coloured substance in the anterior chamber, consisting of cells like blood-cells. Lens greyish and translucent. Retina, vitreous, and choroid in the ciliary area destroyed. The ciliary area of the vitreous space was occupied by a yellow, opaque, creamy substance. The remainder of the interior of the eye was filled with a reddish-white and an opaque pulpy substance; a grey opaque membrane, probably the retina, intervening between the two. The pulpy substance consisted of yellowish-tinged transparent cells, somewhat larger than blood-cells.

Microscopic sections prepared from this eye.—Slides 1 & 2. Parallel sections from near the optic nerve. The retinal vessels are cut transversely. All the retinal elements can be seen. The rods are much disturbed in their regularity; they are deficient in some places, torn in others, while the remainder of the framework appears normal.

182. The greater part of the lateral half of a right eye, most of the interior being occupied by a yellow opaque new growth; which, probably originating in the choroid, has led to perforation and sloughing of part of the tunics near the ciliary region. The retina, the lens, and the vitreous cannot be recognized. The choroid is in apposition with the sclerotic. The iris, with the

opaque lens-capsule adhering to its uvcal surface, can be recognized ; so can the anterior chamber.

183. The opposite half of the same eye. The iris may be seen very near to the cornea. The lens-capsule, which is kept patulous by the surrounding morbid products, occludes the pupil, and adheres to the cornea.

F. S., aged 33, a druggist (under the care of Mr. Hulke, Royal London Ophthalmic Hospital), is a fair, red-haired, rather sickly-looking man ; he suffers from no general illness, and has no hereditary predisposition to tumours. Two and a half years ago, the right eye became inflamed spontaneously, and remained so for three weeks ; objects then appeared smaller when seen with this eye alone. In the following year, another attack, of two weeks' duration, ensued ; there was then less pain, but vision was much impaired. A third attack, accompanied by severe pain in the right temple, soon followed, vision becoming still more misty. Similar attacks now rapidly followed one another, numbering twenty-one in all. Seven months ago, the eye had lost all perception of light ; the upper portions of the retina were first paralysed. Since the last attack, the eye appeared to grow larger. The left eye is healthy. The right eye was excised, July 30th, 1861.

Dissection.—Cornea : peripheral part transparent ; central part infiltrated with pus. Iris in apposition with cornea. Pupil closed by pus. Sclerotic perforated in front of the insertion of one of the recti by a cancerous growth. Lens very soft and transparent. Vitreous space reduced in size, occupied by yellowish vitreous substance and clots of blood. Retina funnel-shaped and detached from the choroid, of a yellowish-brown colour and opaque. The space between choroid and retina was occupied by transparent yellowish fluid and by a melano-medullary growth. Choroid pale brown and anæmic, except at and near the cancerous growth, where it was thickened by infiltration with cancer-cells.

184. The inferior half of a left eye, the section being carried through the optic nerve and parallel with its nerve-fibres. The optic nerve and a small portion of sclerotic near it, and some black lines indicating the ciliary processes, are the only elements of the eye which can be recognized. The remainder of the globe, somewhat retaining its shape, is occupied by a yellow, opaque, grumous substance, enclosing a small cyst near the optic nerve and another one near the cornea.

185. The other half of the same specimen.

F. R., aged 10 (under the care of Mr. Streatfeild, Royal London Ophthalmic Hospital), of fair complexion, was in good health until five years ago, when he suffered from enlargement and suppuration of the cervical glands, and abscesses on the right arm and right foot.

The patient's mother, aged 48, and his father, aged 47, are in good health, so are two sisters and two brothers; a younger brother suffers from weak eyes. Patient's eyes appeared good until twelve months ago, when the left, being exposed to wind, became bloodshot; he then found out accidentally that it was blind. Three months ago, pain was first felt, not in the eye, but in the orbital region, and the eye began to enlarge. The right eye for the last few months, when looking at near objects, has suffered from weakness and lachrymation. The left eye was excised, September 26th, 1861.

Dissection.—Size natural; an irregular staphylomatous state of the sclerotic was observed in the upper and inner part of the equatorial region. The place of the cornea was occupied by fleshy-looking, staphylomatous tissue. Lens small, grey, and opaque, containing calcareous deposits. Choroid, retina, and vitreous missing; their place occupied by a grey, translucent medullary substance, in which there were small and large cavities occupied by a yellow, opaque, and creamy substance. The fibres of the sclerotic passed into this medullary substance.

186. The lateral portion of a right eye, from which the lens, the vitreous, and the retina have been removed. The brown choroid and the sclerotic are in apposition. Upon several parts of the ciliary processes may be seen a greyish opaque substance, consisting of medullary cancer; the place of the ciliary muscle at the line of section is occupied by a similar substance, which retains somewhat the shape of the muscle. There is also a deposit on the outer surface of the sclerotic at its junction with the cornea.

W. M., aged 31 (under the care of Mr. Hulke, Royal London Ophthalmic Hospital), a weakly-looking man, who has never suffered from any particular disease; nor is there any history of cancer in any member of the family. About a year ago he noticed a slight swelling in the right inner canthus; it grew rapidly and without pain for six weeks, when it was removed. One month after this it reappeared, and eight months later was again removed; at that time glandular swellings were observed in front of the right ear and also beneath the lower jaw, some increasing to the size of a pigeon's egg, and then remaining stationary. Much of the nasal part of the sclerotic was exposed by the second operation; after this black dots were observed floating before the eye. The exposure of the sclerotic was followed by ophthalmia and by pain in the eye itself; with the increase of these, vision became impaired, and after six months was entirely destroyed. The pain ceased after vision was lost. The right eye was excised, August 6th, 1861. The slight asthenopia which was present in the left eye ceased after the operation.

Dissection.—The tunics of the eye gave way during excision. Cornea milky, translucent; its lower margin and the adjoining ciliary region obscured by a hard growth, which also had undergone adhesions with the lower lid. Iris in apposition with the cornea. Pupillary area occupied by a grey and opaque membrane. Lens missing. Vitreous changed into a yellowish, transparent, viscid fluid; the hyaloid membrane sprinkled with numerous

chalk-dots. Retina slightly milky, strongly translucent, detached from the choroid, its vessels gorged, its substance sprinkled with numerous blood-spots; near the cancerous growth in the ciliary region it is puckered up into a lump of grey and opaque substance, sprinkled with blood-spots. The epithelium of the choroid appeared changed. The tunics in the inner and lower ciliary region were occupied by a diffuse infiltration of cancerous substance.

187. The lower half of a right eye, the section being carried somewhat obliquely through the optic nerve. The size of the eye is normal, its shape irregular, its sclerotic thin. The choroid is slightly detached from the sclerotic as far as the ciliary muscle. The epithelium has disappeared from some portions of its inner surface, giving it a mottled brown and white appearance. Within the choroid is a yellow, opaque substance, which in shape resembles a detached retina changed by morbid deposit; and within this are seen delicate, greyish, translucent membranes—the vitreous together with the lens-capsule. The anterior chamber is large, and bounded posteriorly by a narrow black rim of iris.

From a fine, fat, and healthy-looking child, aged 5 years. For the last three months the child has been restless; complains of pain in the right eye, and vomits frequently. The mother states that from early infancy this eye had a peculiar shining appearance. The eye was excised.

Dissection.—Shape and tension normal. Cornea transparent. Anterior chamber large. Pupil dilated, fixed; a yellow reflection from its area. Crystalline lens transparent. Vitreous: two-thirds missing; the remainder yellowish and transparent. Retina detached from the choroid, funnel-shaped, infiltrated with yellow, opaque, flocculent medullary cancer. Sclerotic and choroid in apposition.

Microscopical preparations from this eye.—Slide 1. An accumulation of cells from the intraocular cancerous growth.

Slide 2. Three sections of the sclerotic, showing its infiltration with cancer-cells.

188. The upper half of a right eye, the section being carried through the middle of the optic nerve and parallel with its nerve-fibres; attached to the entrance of the nerve, and projecting into the eye, is a yellowish-white, opaque, flocculent substance, consisting of a small portion of the retina changed by cancerous growths. The size of the eye is normal; its shape irregular. The choroid has in many places become slightly detached from the sclerotic; its inner surface is sprinkled with yellow and black patches; and in the ciliary

region it is infiltrated with medullary substance. The anterior chamber is large. Numerous circumscribed patches of cancerous deposit may be seen in the iris.

E. M. T., a female child, aged 2 years and 9 months (under the care of Mr. Poland, Royal London Ophthalmic Hospital), was admitted, June 1860. On the 15th of this month, for the first time, her mother noticed a white opaque appearance in the pupil of the right eye, and found that the child could not see with the eye. She was a very healthy-looking child, and, excepting the disease of the eye, appeared quite well; nor was there history of any previous ill-health. Through the pupil was seen a yellowish tremulous mass, which on minute examination was found to be disposed in three equal segments; it appeared to be a yellowish-brown effusion behind the retina, which had displaced this membrane in three divisions. Ramifying in these segments were seen enlarged retinal vessels. Between it and the iris was a floating cloud. The iris acted only when light was thrown on the other eye. On November 13th it was noticed that the pupil was dilated, and the retina appeared looser, as if moveable in fluid; patient was still quite well. On January 30th, 1861, there was a little diarrhoea and some irritability of the eye, and patient seemed suffering somewhat from debility. Towards the end of March the opaque mass in the eye increased, pushing the iris towards the cornea. Excision was performed on the 10th of April. The child improved in health after the operation, from which she recovered in a few days.

Dissection.—Shape and size normal. Cornea transparent. Iris hidden from view by a grumous buff-coloured substance occupying the anterior chamber; this consisted of nucleated cells. Lens grey and opaque; the pupillary area closed by a grey and opaque membrane. Vitreous missing. Retina funnel-shaped, detached from the choroid. Sclerotic and choroid in apposition with each other. Some of the ciliary processes, portions of the choroid, and the optic nerve both within the tunics and outside the eye were infiltrated with similar nucleated cells; some of these appear to have dropped into the anterior chamber from infiltrated portions of iris. The space between the retina and the choroid was occupied by turbid fluid, similar to that in the anterior chamber.

Microscopic sections prepared from this eye.—Slide 1. A section of the choroid, showing the infiltration of the choroidal tissue with cells of a cancerous character. The stellate pigment-cells are separated from each other by the intervening new growth.

Slide 2. An accumulation of the cells of the new growth. They resemble in shape and size blood-corpuscles, but are filled with minute granules.

Slide 3. Three transverse sections of the optic nerve, near the outer sclerotic aperture. The connective tissue and the bundles of optic nerve-fibres can be recognized, but they are disturbed in their relative position.

Slides 4 & 5. Transverse sections of the optic nerve from near the outer scleral aperture. The large bundles of connective tissue, the blood-vessels, and the bundles of optic nerve-fibres can be recognized. The bundles themselves appear about half the natural size. The individual fibres of the optic nerve, as well as the intervening fibres of connective tissue, can hardly be recognized; they appear as an obscurely molecular mass.

189. The lateral half of a right eye, the vitreous space of which is occupied by a yellowish-grey, opaque, and flocculent substance. The sclerotic and the choroid can be recognized; the latter is infiltrated with pus. The retina is changed into a yellow, opaque membrane, which adhered firmly to the substance in the vitreous space. The lens and the proper vitreous substance are absent. The section is carried through the cornea and through a greyish-black and opaque substance, which has destroyed its lower half together with the adjoining iris, thus establishing a perforation of the tunics at this part.
190. The opposite half of the same eye, the retina and the contents of the vitreous space having been removed. The circumscribed yellow patches upon the brown, thickened choroid are deposits of pus. The seat of the perforation of the cornea and the iris is well seen.
191. The retina, the suspensory ligament, and the contents of the vitreous space removed from the last preparation.
- The eye was excised, from a patient of the Royal London Ophthalmic Hospital, August 8th, 1860. No particulars of the history of the case were obtained.
- Dissection.*—The shape of the eye was rendered irregular by some substance projecting from its interior, beneath the conjunctiva at the lower ciliary region. The upper two-thirds of the cornea were transparent; the lower third and the area of the pupil were obscured by a pulpy, red-brown, and opaque substance, which grew from the deeper parts of the eye. Crystalline lens and vitreous missing. The vitreous space was filled with a brown-red, pulpy, soft mass, composed of blood-corpuscles and nucleated cells. Choroid separated from the sclerotic by a little fluid, which was reddish, thick, and infiltrated with pus. The contents of the vitreous space had perforated the tunics in the lower ciliary region.
192. Two equatorial portions of the tunics (sclerotic, choroid, and retina) of a left eye. The sclerotic and the brown choroid are in apposition with each other. The retina is slightly greyish, strongly translucent, and thrown into delicate folds.
193. Two equatorial portions of the sclerotic and choroid of the same eye. The brown choroid and the sclerotic are in apposition with each other. The

choroidal epithelium having been removed in several places, the pale-brown choroid is seen exposed, showing that the so-called epithelium contributes more towards the brown colour of the membrane than the stellate pigment of the choroid proper.

194. Portions of the retina removed from the sclerotic and choroid of the last preparation. Brown-coloured bits of the choroidal epithelium may be seen adhering to some parts of the outer surface of the retina.

G. G., aged 17 (under the care of Mr. Critchett, Royal London Ophthalmic Hospital), a thin, delicate-looking boy of fair complexion, is descended from healthy parents. The left eyeball was slightly protruded outwards and upwards. It could not be inverted beyond the middle line, but was unimpaired in its other movements; it could for a moment be pressed back into the orbit. When this was done, an elastic resistance was felt from the depth of the orbit; but no marked tumour could be detected; a slight swelling of the bones of the right orbital margin was perceptible; there had never been any pain. Within the last three days, vision of the eye had been completely lost. An exploratory incision made along the upper orbital margin was followed by hæmorrhage and considerable exophthalmus with exposure of the cornea, which in twelve hours became nebulous, while the conjunctiva became chemotic. No pain was felt. The eye was excised, July 9th, 1861.

Dissection.—The central and peripheral portions of the cornea were infiltrated with pus, the remainder nebulous. Aqueous humour turbid. Lens, vitreous, and retina healthy. Choroid in the retinal area healthy; in the ciliary area a grey opaque exudation was deposited upon its inner surface; there were also small deposits of pus upon the anterior surface of the iris. Optic nerve normal. A cancerous growth was found occupying the apex of the orbit.



